Post-graduate Lecture
ON
SEPTIC OSTEITIS IN CHILDHOOD.

Delivered at the Hospital for Sick Children on May 17th, 1894,

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GENTLEMEN,—Many months ago, when the zealous dean of our medical school, Dr. Barlow, asked me to fix the date of my post-graduate demonstration and to give him the title of it, I thought that I could not choose a more important or interesting subject than that of acute inflammation of a diaphysial extremity, and I hoped that I might happen to have in my ward at the time some illustrative cases. It so happens that I have two cases of this nature to bring before you to-day, and the fact of their being mild examples of the disease by no means deprives them of all clinical interest. Indeed, in some respects it actually increases that interest. All cases of septic osteitis cannot be of equal and typical severity any more than can those of gangrene or erysipelas, diseases which, by the way, belong to the same family as that of which septic osteitis is an important member. That the disease is not an uncommon one is manifest from the fact that at the present time I have two cases of the femoral variety in my own ward, whilst my colleagues have kindly placed two similar cases at my disposal for this afternoon should I find opportunity for making clinical remarks concerning them.

CASE 1.—The first case that I have to show is that of a boy eleven years old, who was admitted on Feb 6th with a considerable swelling about the lower part of the right thigh, which had been coming on for about thirteen weeks. No history of injury was obtainable, but the illness began with an attack of shivering. In children, as you are probably aware, convulsions or shiverings are of equal clinical import to the rigor which ushers in the acute septic diseases of adult life. I find it recorded in the notes which Mr. Marshall has taken of this case that at the same time that the boy's thigh-bone was attacked he had pain and stiffness about the right shoulder. For this the practitioner who was treating him at home prescribed a liniment, and in about a week this trouble apparently passed away. Apparently, I say—not actually; for we shall hear of its disastrous effects later. You will notice that the boy is healthy looking; the report says that he has four healthy brothers and sisters. There is, moreover, nothing to show that his general health had been recently disturbed by an attack of measles, scarlet fever, influenza, or any other exhausting disease. In these cases of para-epiphysial inflammation—either with or without a history of local injury—there is very often an account of some antecedent illness which had grievously disturbed the nutrition of the patient. In such circumstances all the tissues would suffer, and little wonder if the delicate new bone at the end of a diaphysis suffered most. For this, then, would be the part of least resistance, and upon it the septic micro-organisms, which had already gained an entrance by the bloodvessels and had triumphed over the colourless corpuscles, would seize. There, moreover, they would undergo a prolific cultivation, setting free highly poisonous albuminoses or ptomaines to poison the blood and to disturb and exhaust the nervous system.

At the time of the boy's admission there was a general swelling about the lower end of the femur and in the popliteal space; and though there was no particular tenderness and no redness of the skin there was a superficial fluctuation above the inner condyle suggestive of an abscess which was quietly making its escape. There was no affection of the knee-joint, but, so far as could be made out through the surrounding tissues, the conclusion was formed that there was enlargement of the bone, and this, it was thought, was probably due to the presence of a sequestrum which had rapidly formed at the end of the diaphysis. Here I show the lower end of a dried femur, borrowed from the museum of St. Mary's Hospital, which is of an exactly similar nature. You will notice that the lower epiphysis is not yet ossified on to the diaphysis, and that at the very end of the diaphysis is a cavity from which a small sequestrum has been removed. You will notice, moreover, that the neighbouring bone is considerably thickened by deposit of new bone from the deep layer of the periosteum. Doubtless this state of affairs was associated with an abscess in or near the popliteal space. In such cases the proper site for making the incision through which the surgeon explores for a sequestrum at the lower end of the femur is in the interval between the ilio-tibial band and the tendon of the biceps. At this situation, therefore, in the boy before you, a free incision was made down to the bone; but the superficial abscess was first evacuated upon the inner side. A leaf-like sequestrum having been removed from the popliteal surface of the bone, a fistulous opening was found running into the end of the somewhat thickened diaphysis; and when this opening had been enlarged a loose sequestrum of the size of a horse-bean was extracted. The cavity was then scraped out and drained, and in six weeks the wound had practically healed.

At about this time, however, the boy began again to complain of pain at the upper end of his right humerus, where in due course a hard swelling formed, free from tenderness, heat, and redness. It is probable that anyone seeing the child then for the first time, and hearing nothing of the former trouble, would have taken the tumour for a periosteal sarcoma. The history of the case, however, seemed to indicate that the cause of the enlargement was probably a sequestrum at the end of the humeral diaphysis, about which a mass of succulent interstitial granulation tissue was growing, as was the case with his femur. An operation, therefore, similar to that which had been performed on the thigh, was undertaken for the shoulder. Here is Mr. Marshall's description of it:—"April 4th: Mr. Owen made an incision down to the bone over the upper end of humerus, and found a cavity on inner side of the upper end of the diaphysis, with sequestrum and new bone around it. Bone gouged away and dead bone removed; joint free; no pus; plugged with cyanide gauze, and rest of wound sewn up. April 20th: Wound nearly closed." To-day, that is about six weeks after the second operation, you see that the boy is in excellent health and spirits, that the wound near the shoulder is perfectly closed, and that of the wounds near the knee, that which was made in the anatomical situation has absolutely healed, whilst that which nature was somewhat unfortunately making on the inner side of the limb is still weeping.

CASE 2.—The second case is that of a girl aged three years. I report it from notes taken by a clinical clerk, Miss Boardman, who has made her excellent notes still more valuable by some rough sketches. The child, it appears, had been quite well until fourteen weeks before admission. She was one of nine children of a labourer, and at the onset of the illness she had had an attack of bronchitis. Her first complaint was of "weakness" of the left leg. Soon after this the thigh began to swell. In due course an abscess formed, and five weeks before admission this was lanced by the practitioner who was attending the child at home. The child lay in bed in hospital with the pelvis tilted and the limb everted. The thigh was greatly swollen and a sinus was discharging on the outer side just above the knee. The joint itself was unaffected. Under chloroform the sinus, which had been placed by nature in the correct anatomical situation, just in front of the biceps, was extended freely upwards and the shaft of the femur examined. It was then found that the diaphysis was almost entirely necrosed and that the bone had broken across at the junction of the upper and middle thirds. The sequestrum comprised a considerable part of the shaft of the femur, as you see indicated by the sketch in the note-book. In a few days the child was attacked with measles, and as she was removed to the isolation wards we lost sight of her; but the wound gradually ceased discharging and the granulation tissue thrown out from the vigorous periosteum at the seat of fracture soon produced consolidation of the bone. As you notice to-day, the wounds in the thigh have almost healed, and the femur, though somewhat shortened, is quite solid.

These two children are interesting examples of the quiet form of one of the most terrible diseases to which children are liable—namely, septic inflammation of bone and marrow. Generally the disease is acute and fulminating, the child being carried off, perchance, before the diagnosis is actually made. Sometimes, as in these children, it runs its course with comparatively little outward manifestation; but even in its mildest form the effect produced upon the bone is serious enough to determine death of the affected part. As I have already remarked, it begins usually in that delicate layer of

young osseous tissue at the end of the diaphysis, often spreading like wildfire through the diaphysial bone and marrow. Here is the injected specimen of a femur which I removed by amputation from a child a few weeks ago. A vertical section has been made through the bone, and you will notice that the starting point of the large subperiosteal abscess was, as I have described, from the very end of the diaphysis. The pus had evidently been working its way inwards along the plane of the junction cartilage. Still, the epiphysis itself is unaffected.

Diagnosis from acute rheumatism.—In these cases of para-epiphysitis obviously the bone cannot expand however acute the inflammation may be; but the periosteum and its vessels are engorged and exudation takes place into the tissues around them. Thus there is usually a central thickening to be made out and it is extremely tender. If the affected bone happen to be near the skin as the tibia, for instance, the skin becomes red, hot, and œdematous. And if, then, the height of the inflammatory trouble is close against the tuberosities of the tibia a casual or inexperienced observer would be apt to look upon the case as one of articular rheumatism. Viewing the signs together, it is evident that unless one is on one's guard it is easy to mistake this form of osteo-myelitis for acute articular rheumatism. Here, for instance, would be a likely and a misleading case:—A boy who happens to have a "rheumatic" father is playing out in the wet days of a cheerless November. He may have been out of condition, and he may have had a blow or a fall upon the knee some few days before and have forgotten all about the hurt. One evening he comes home crying and saying that his knee "hurts" him and is stiff. His mother takes off his wet boots and trousers and puts him to bed, where he passes a very restless night. In the morning the mother looks at the leg and finds the part against the knee flushed, hot, and tender. She knows nothing about diaphyses, epiphyses, or synovial membranes, but she has some practical acquaintance with rheumatism; and, knowing nothing else, she may consider herself a specialist in that department of practice. So she applies a fomentation, and she calls in a medical man, telling him that her boy has "rheumatism at the knee," which he must have inherited from his father. (In my experience it is the custom for mothers to attribute the physical as well as the moral defects of their children to paternal inheritance.) He takes the boy's temperature, and finds it registering 103° F. or even more. He notices that the boy is evidently the subject of a sudden and acute illness; he hears that he has been playing in the wet; he uncovers the knee and finds the skin hot and flushed, as described by the mother, and, unfortunately, he accepts her diagnosis. Then he administers salicylic acid; but, in spite of this, the boy gets worse. His temperature goes up to 105°, he has convulsions or shiverings, and he becomes delirious. Delirium, let me remark, is often a prominent symptom in these cases. Probably the medical man does not look at the knee again for some days. Why, indeed, should he? For if the boy has rheumatic synovitis, which was his diagnosis, no practical advantage could be obtained by uncovering and examining the part. When at last his attention is redirected to the limb he is surprised to see it greatly swollen and to detect fluctuation over the shin. By this time all the harm is done, and if the boy escapes with his life it will probably be only at the expense of the limb.

Still, the differentiation of acute para-epiphysitis from acute rheumatism is, as a rule, with a little trouble and care, easy enough; *the heat, the swelling, the pain, and the tenderness are close to the articular area, but they do not involve it;* at least, not at first. The tenderness is limited to the region of the bone close below the junction cartilage, and at that particular part there is a definite thickening. In articular rheumatism, on the other hand, the swelling, the fulness, and the redness are confined to the area of the synovial membrane, and there is no thickening about the bone. I will admit that when the lower end of the femoral diaphysis is the starting-point of the acute septic inflammation some confusion may possibly arise from the fact of the subcrural pouch of the synovial membrane overlying and sympathising with the troublous area. But even then the true nature of the disease can easily be determined by gently pinching the lower end of the femoral diaphysis from side to side between the finger and thumb, and making a comparison with the opposite femur. Moreover, if the examination be carefully made, it is found that the joint may be flexed and extended without causing distress or alarm.

Such an error in diagnosis is lamentable, and unfortunately it is constantly being made. And this not only by young and inexperienced practitioners. In some cases the exact diagnosis is, I allow, very hard to reach, as, for instance, when the upper end of the femoral diaphysis is the part affected. This part of the femur, it will be remembered, is within the capsule of the hip-joint, and it is more than likely that such a para-epiphysitis will be taken for acute rheumatism or ordinary hip-joint disease. (A case of this nature which had obtained admission into a medical ward was then briefly described.) Yes; when the upper end of the femoral diaphysis is the seat of the disease the diagnosis becomes a very difficult matter. The affected part is so thickly shrouded in gluteal, adductor, and other muscles, that it is difficult to make a critical examination of it. And as the diseased bone is within the capsular ligament the case seems for all the world one of articular disease, and it almost invariably ends as such.

Here is another similar case. A girl three years old was admitted to the Louise Ward last June with pain and stiffness in the left hip-joint. The limb was flexed and adducted, and there was some lordosis. The neck of the femur—that is, the end of the diaphysis—was thickened and tender. So definitely thickened was it that we thought it might very likely be a case of para-epiphysitis. So we tunnelled along the neck of the bone by trephining the great trochanter, and had the good fortune to extract a sequestrum of the size of a pea, which was covered with a layer of granulations and had lain loose in a small cavity near the cartilage which joins the head to the neck of the femur. We then scraped out this cavity with a slender scoop and irrigated with a solution of zinc chloride. The wound healed up and the child was sent out of hospital greatly improved and wearing a Thomas's splint. All this was accomplished without breaking through the cortical layer of bone, and therefore without implicating the articular cavity. But it was too late to save the joint, it appears, for some months later, and greatly to my disappointment, the child was re-admitted for definite hip-joint disease.

There are two other points in connexion with the diagnosis of para-epiphysitis from articular rheumatism to which I must refer. The first of them is with regard to the influence—or, rather, the want of influence—of salicylic acid upon the case. Of the great value of this derivative of carbolic acid in the treatment of acute rheumatism there are not, I apprehend, two opinions. Am I in error if I say that when a practitioner has diagnosed what he takes to be acute rheumatic synovitis he, almost as a matter of course, prescribes salicylic acid? He expects a beneficial result as certainly as if he were giving quinine for ague. If, then, the child has taken several doses of the acid and the temperature and the distress have not abated, he suspects that there is some misunderstanding. And so great is his faith in the drug that he actually begins to doubt his diagnosis. Then, on again looking at the limb, he finds it flushed over an extensive area, but not specially so about the joint; he examines the tibia and satisfies himself that it is exquisitely tender and that a large abscess has formed around it. The case is shipwrecked, so he says that it is a "proper case for a hospital." This is the condition, then, in which many of the children reach the hospital. I hope that you will not think that I have stated the case too bluntly. But the whole matter is of very great importance, and, though I would not for a moment like to give offence, still I do not want a careless *congrère* to leave the court, as it were, "without a stain upon his character." I want to draw his earnest attention to the matter, and for this reason I will ask you one and all to come round the table and gently to pinch the lower end of this boy's femur between your finger and thumb. In this way, I think, you will have the most prominent feature in the diagnosis of these cases nailed to your memory—the thigh bone is thickened just above the knee, but the joint itself is unaffected.

The other point to which I wish to refer is that not infrequently two or more limbs are similarly and simultaneously affected. This certainly suggests the constitutional origin of the disease, and is particularly apt to mislead the inexperienced observer. The disease is constitutional; but it is pyæmia, not acute rheumatism. Let me give two illustrative cases. A feeble lad, who made his living by chalking snow scenes, broken plates, and mackerel upon the pavement, was admitted into St. Mary's Hospital with a red and acutely inflamed area just below each patella. The weather had been wet and cold, and the boy was only poorly clad. His temperature was extremely high and he was very ill. What

wonder if his distress had been ascribed to "rheumatism"? The disease had made great headway before his coming into the hospital and both knee-joints were involved. One knee was completely disorganised, and the tibia of that side was so extensively implicated that amputation of the thigh was imperative. The other limb, however, we just managed to save. I shall have occasion again to refer to this case. In the meantime I will call attention to another case of not polyarticular disease—for at first the joint is always free—but symmetrical para-epiphysial disease. I published the notes of the case in THE LANCET of March 4th, 1893. It was an extremely interesting case of septic disease of the upper end of each humeral diaphysis in an infant two years old, and it had for a time been regarded as one of acute rheumatism. The illness had begun a fortnight earlier with a succession of convulsions. The child looked extremely ill; the temperature was 104·4° F., and there was a tense, red swelling, with fluctuation, across each shoulder-joint. We regarded it as a case of pyæmic infection, and surmised that there was a sequestrum already formed in the end of each humeral diaphysis. Within an hour of the child's admission we had excised each shoulder-joint, clearing away sequestra and granulation tissue. The child made a complete recovery, and though his arms are shorter than they should be, they have free and painless movement at the joint. I am sorry that the mother has not brought the child here to-day, but I pass round for your inspection a specimen of an arm that I amputated at the shoulder-joint, which illustrates the condition of the parts as they existed at the time in the two resections just alluded to, except that in this morbid specimen the sequestrum is very large, comprising half an inch or more of the end of the diaphysis. The difference in these two cases was, however, only one of degree. In the resection case neither humerus was so extensively diseased as was this of the amputated arm.

Treatment.—Recognising the desperate nature of these cases their treatment must needs be prompt and energetic. With swelling and tenderness at the end of a diaphysis, together with a high temperature and other signs of constitutional disturbance, the surgeon should cut down upon the affected tissue. He should by no means wait for fluctuation or for other obvious signs of suppuration. As happened n the case of the shoulder of the boy whom I showed this afternoon, there may be no pus. Parents seem imbued with the idea that no tender swelling should be "lanced" unless there is ample evidence of "matter" beneath, and I have known members of our own profession share that notion. In a case of this sort it would be difficult to find a line of procedure more fraught with danger. Delay allows the septic inflammation to make irremediable havoc, so that the sooner the area of disease is attacked and cleared out the better. To wait for fluctuation is to give the staphylococci and other micro-organisms the full opportunity of doing their worst. An incision should be made down through the periosteum, and if pus by chance be found beneath it the abscess cavity should be thoroughly washed and swabbed out with a solution of chloride of zinc (20 grs. to 1 oz.). Further, search should be made for the line of the junction cartilage, and if an opening be found into it, it should be enlarged and the interior scraped and washed. If no pus be found beneath the periosteum the diaphysis should be trephined in several places, the intervening pieces of bone being cut away, the suppurating marrow scraped out, and the cavity swabbed with the zinc solution. It is impossible to be too thorough in these procedures; sometimes after the operation nothing is left of the diaphysis but the thin shell of its compact tissue. The cavity should then be filled with gauze and the wounds dressed with wood-wool tissue, the limb being secured upon a splint. Quinine, iron, and morphia are likely to be the only drugs needed.

Complications.—Lastly, comes the question of complications. Seeing how close the focus of the disease is to the joint, there is little wonder that the septic process invades and destroys the articulation in a large proportion of the cases. There are two ways in which the pus finds its way into the joint: one is by perforating the epiphysis, and the other by working its course beneath the capsular ligaments and the periosteum. This injected specimen of tibial diaphysitis, which I now pass round, shows how the pus found its way into the knee-joint by working through the epiphysis. The boy was under my care at St. Mary's Hospital. His condition was so desperate at the time of his admission that there was nothing for it but to amputate his thigh, after which he made a prompt and complete recovery. If a case is seen shortly after the explosion in the knee-joint, and the diaphysial affection of the tibia is not too widely spread, excision of the knee-joint, together with a free scraping about the junction cartilage, may possibly prove sufficient. I have had two successful cases of this sort, but time will not permit my now referring to them even in detail. Excision of the joint, or any other conservative operation, can be resorted to only, let me repeat, when the epiphysial and the diaphysial trouble is limited in extent. Generally there is no alternative to amputation.

In many cases the septic inflammation spreads rapidly through the whole diaphysis, the disease being then termed osteo-myelitis. The injected specimen which I hand round well illustrates this serious condition. You will notice that the bone appears sodden with suppurating areas, and dotted with nuggets of potential necrosis. The vessels were plugged with septic thrombi, and the whole of the diaphysis was doomed when amputation was resorted to. If a child survive the acute attack, suppuration loosens the diaphysis from the periosteum and from the epiphyses in due course, and, on opening the large abscess, the surgeon may lift out the diaphysis as a solid sequestrum. I regret to say that this condition of affairs has received a separate name, being described in our text-books as a distinct pathological entity under the heading "Acute Necrosis." There is no such disease. The disease was acute septic osteo-myelitis, and necrosis is the result of it. To look upon the necrosis as a disease by itself is, in my opinion, unscientific; and, what is worse, it draws away the practitioner's attention from the primary and actual trouble. It is almost a matter of surprise that in so many of these terrible cases of diaphysitis the articular ends of the bone completely escape; but we must remember that the vascular supply of the shaft and of the extremities of the developing bone are entirely distinct, the junction cartilages delimiting the vascular areas absolutely and completely.

Exhaustion and hectic fever are other complications of the disease. The latter condition is a variety of ptomaine poisoning, and is met with in those cases in which septic discharges are decomposing in an invaded joint or in some other large cavity. This condition, as well as a contingent albuminoid disease of vessels and viscera, may, however, entirely clear away after amputation has been resorted to. So, also, is it with regard to pyæmia, after amputation and a clearing out of secondary abscesses, the child may rapidly get well. If, however, the case has been misunderstood from the beginning, so that there has been lamentable delay, and particles of septic thrombi have been carried hither and thither through the child's tissues, even amputation may prove disappointing. The poor pavement artist, to whose case I alluded a little while ago, was a sad instance of the way in which the septic condition may drift on into general pyæmia. He had secondary abscesses on his forearm, shoulder, and chin; he was anæmic and miserable, and amputation of a thigh by no means put an end to his troubles.

An Oration:

A DOCTOR'S HOLIDAY.

Delivered at the Annual Conversazione of the Medical Society of London on May 21st, 1894,

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MR. PRESIDENT AND GENTLEMEN,—

"Neque semper arcum tendit Apollo."

All men, whatever their occupation, need periods of relaxation from work. These may come in short intervals of the days of work and are by common consent at certain times of the year more extended. Men take their rest in various ways. It is possible for some entirely to forget that to which their lives are in the main devoted and to plunge abruptly into pursuits of altogether different kind. Neither idleness, the "strenua inertia" of the poet, nor distraction, seem to me

to be for the physician the most appropriate form of recreation or diversion, if we regard the question from the highest, and also, as I think, the most practical point of view. It seems to me absolutely necessary that we, who are for the most part of the twelvemonth in close contact with humanity, are studying human beings, and looking on all sides for help in that study, may often find benefit, and always certainly pleasure, when we take leisure in the library, or pleasure afield, to find the truest rest in the riding of some hobby, which gallops one way or the other from man to the nature around him. We can see instances of the usefulness of such extensions of professional occupation into regions of pleasant diversion in such works as that of the late Dr. Paris, entitled "Philosophy in Sport made Science in Earnest," in Sir Thomas Browne, in Sir Henry Holland, and in Professor Gairdner's "The Physician as a Naturalist." The last orator of this society pictured in an eloquent way the help given by literary study to the healer.

I propose to-night to ask you to follow me in a ramble among subjects more or less cognate to our own profession and its studies, including some "horæ subsecivæ" of rest in reading, here and there with divergence into some more remote paths branching off into literature not at all medical. In fact, I am going to ask you to go out with me on my autumn holiday. In the autumn of the year before last I was staying for a few days at the Land's End. It happened one day that I had engaged a boatman to take me out a-fishing in Whitsand Bay, a mile or so to the north-east of the point. When I arrived after a pleasant walk I found that fishing was impossible by reason of a great swell coming in from the Atlantic; yet the bay itself was free from wind, and the sky was clear, so that the sun struck unhindered through the big green rollers as they broke upon the rocks in the mouth of the bay. The bay is formed by a break in the massive cliffs of this iron-bound coast and is on the land aspect a wide expanse of yellow sand, sloping upward to a considerable height. To sit upon some rocks emerging from the sand and to watch the sun's rays turned into the most brilliant green, as the rollers swept onward, was for the time a slothful pleasure. Presently, satiated with this, one began to look about and take in more of the surroundings. On the dry sand above high-water mark there first claimed attention a broad band of pale green colour, suggesting the idea of a delicate green veil cast across the bosom of the yellow sand. On investigation this turned out to be a bed of the wave-leaved stock (matthiola sinuata). This sea stock is not in itself a very beautiful plant. Its foliage is coarse, thick, and entirely devoid of symmetry or elegance. It looks like a plant which might have been beautiful, but, like some old statue, has had its fine lines worn away by wind and weather. Its flower is dingy and unattractive, yet its colour, as its leafage was scattered not too closely over the sand, made a beautiful harmony. It had for me, however, a more than redeeming quality. I knew it to be one of those plants which give forth scent at night. Such plants are mostly, in plain terms, ugly. Some of them have a faint scent during the day, increasing through the twilight to the darkness. It was a great delight to me as a boy to be taken of evenings into a little greenhouse containing several specimens of the night scented stock—matthiola, or hesperis, tristis—and to enjoy the lovely perfume of their flowers, richer and more delicate than the perfume of any day stock. By day the plants were apparently but half alive, and the petals of the flower hung down shapeless, dingy purple, and, as I may perhaps best express it, unkempt. With night the plant developed a new life and exhaled its exquisite odour. I wondered then, as I wonder still, what might be the meaning of this nocturnal activity of a plant. It is certain that in the day time plants break up carbon dioxide, retain the carbon, and set free the oxygen. It is probably also true that when the sun's influence is absent they absorb oxygen. How much of this is done by the foliage, and how much by the flowers, I do not know, but these plants have almost always made me think that under a process of oxidation odours were produced from the flowers which could not be evolved when the growing life of the plant was in progress. I suppose that it is certain that this perfume has for its real object the attraction of moths for the purpose of fertilisation. The Cruciferæ generally are, no doubt, capable of self-fertilisation, but in the interest of plants cross-fertilisation is necessary; and so these plants, so unattractive in every way by day, appeal to the sense of smell of vespertinal insects. The whole aspect of flowers which are closed or unattractive by day and open in the evening or at night has been suggestively treated by Sir John Lubbock on "The British Wild Flowers in relation to Insects." The belt of sea stock was, as one moved on shoreward, encircled by a crescent of very different colour, a belt of sea holly. As it breaks from the surface of the sand the sea holly, eryngium maritimum, has marked attractions. The form of its leaves is, indeed, very much like that of the leaves of the common holly. Their colour is very noteworthy. It is the glaucous colour which belongs to so many seaside plants. The word "glaucous" may be taken to mean a green colour overlaid with grey, or with blue, or with a film of white. Probably it has its origin from the sea god, Glaucus, and its meaning is clearly "green, such as of the sea." The eringo flower consists of compound heads of considerable size and rich blue lustre. The blue is not of the violet nor of the cornflower, but rather a rich turquoise. I will give you the description of it by the old naturalist Gerarde: "It breaketh forth on the top into prickely or round heads or knops, of the bignesse of a walnut, held in for the most part by six prickely leaves, compassing the top of the stalk round about: which leaves as well as the heads are of a glistring blew; the floures forth of the head are likewise blew, with white threads in the midst." To find a plant of such great beauty springing from the sand without association of other herbage creates an impression of strangeness and great contrast. All botanists, however, know that this contrast is not by any means uncommon. On the sandy dunes of our coast there springs from the sand a convolvulus, soldanella, surpassing the convolvuli of the inland in size, in form, and in delicacy of colour, having a corolla of porcelain-like texture; and botanists will also remember the little glaux maritima, with its thickly crowded branches of small, short, closely appressed and pointed leaves, and its small, solid, pink flowers. Beautiful as the sea holly is above the sand, it has an interest below the surface; it has a root altogether excessive in proportion to the size of the plant as seen on the shore. This root is of about the size of the stem of the laminaria, the oar-weed of our shores. To quote Gerarde: "The root is of the bignesse of a man's finger, very long, and so long as that it cannot be all plucked up, unlesse very seldom: set here and there with knots, and of a taste sweete and pleasant."

For at least 300 years—and, I believe, up to the present time—there have been attributed to this root properties of a cordial and restorative nature, nay more, aphrodisiac. Before Gerarde wrote about it the aphrodisiac uses in particular must have been generally known. It appears to have been chiefly candied for use and was at one time produced in large quantities in the south of England, particularly about Colchester. It is evident that, in the days of its repute, the confection was prepared with very great care and not a little skill. Gerarde gives a minute account of the accepted fashion of candying, or "conditing," as he calls it, of eringos.

"THE MANNER TO CONDITE ERINGOES.

"Refine sugar fit for the purpose, and take a pound of it, the white of an egge, and a pint of cleere water, boile them together and scum it, then let it boile untill it become to a good strong syrrup, and when it is boiled, as it cooleth, adde thereto a saucer full of rose-water, a spoonefull of cinnamon water, and a grain of muske, which have been infused together the night before, and now strained; into which syrrup, being more than half cold, put in your roots to soak and infuse until the nexte day: your roots being ordered in manner hereafter following: These your roots, being washed and picked, must be boiled in fair water for the space of foure houres, untill they be soft; then must they be pilled cleane, as ye pille parsneps, and the pith must be drawn out at the end of the root, and if there be any whose pith cannot be drawne out at the end then you must slit them, and so take out the pith; these you must also keep from much handling that they may be cleane; let them remain in the syrrup till the next day, and then set them on the fire in a faire broad pan untill they be verie hot, but let them not boile at all; let them then remain over the fire an houre or more, remooving easily in the pan from one place to another with a wooden slice. This done, have in readinesse great cap or royall papers, whereupon you must strew some sugar, upon which lay your roots after that you have taken them out of the pan. These papers you must put into a stove or hothouse and harden, but if you have not such a place lay them before a good fire. In this way, if you condite your roots, there is not any that can prescribe you a better way. And thus may you condite any other root

whatsoever, which will not only bee exceedingly delicate, but very wholesome, and effectuall against the diseases above named."

This is what he says about their uses: "The roots of sea holly boiled in wine and drunken are good for them that are troubled with the collicke; it breaketh the stone, expelleth grauel, and helpeth also the infirmities of the kidneys, provoketh urine, greatly opening the passages, being drunk fifteen days together. The roots themselves have the same property if they be eaten, and are good for those that be liver-sicke and for such as are bitten by any venemous beast; they ease cramps, convulsions, and the falling sickness, and bring down the terms. The roots condited or prepared with sugar, as hereafter followeth, are exceedingly good to be given unto old and aged people that are consumed and withered with age and which want naturall moisture. They are also good for other sorts of people that have no delight or appetite to venerie, nourishing and restoring the aged, and amending defects of nature in the younger." It is clear that the aphrodisiac qualities attributed by Gerarde and others to the candied eringo were matter of belief and practical use in former times. The pages of the Elizabethan dramatists teem with allusions to this quality. In the "Merry Wives of Windsor," Falstaff,[1] in need of such help, says as follows: "Let the sky rain potatoes, let it thunder to the tune of 'Green Sleeves,' hail kissing comfits, and snow eringoes." So, abundantly elsewhere. In the plays of the time one finds eringoes mentioned in this sense, and particularly recommended to elderly persons about to marry. The botanists of the time attributed the restorative qualities of the eringo to its cordial influence. This is not improbable, but there is much interest in the association of the potato with the eringo for the same purpose. In the "Elder Brother" of Beaumont and Fletcher, Act IV., Scene IV., we find as a preparation "potatoes and eringoes, and, as I take it, cantharides." Elsewhere a potato pie has the same function allotted to it. Now it appears that at the time of which we are speaking the word "potato" was applied to several roots, or tubers—namely, to a kind of yam, to the root of a plant belonging to the order Convolvulaceæ, and to the potato as we know it. The first two appear to have been dealt with in common more frequently under the name of "batata" than potato. Both of them were sweet roots, and lent themselves to the preparation of conserves. Neither of them could be cultivated in this country. In an old book I find the following remarks: "Sweet potato: Sisarum Peruvianum: Convolvulus batatas, or Ipomœa batatas. This is probably the dramatist's potato. It is not suitable for cultivation in this country. Gerarde bought roots of this at the 'Exchange in London'; he planted them, but they were speedily killed by the climate."

The potato which we know came into use about the same time as the other kinds. Its ready susceptibility of cultivation has made it practically a natural fruit of the country. Coming in with the others, and having a somewhat similar name, it assumed, in the popular opinion, some of their virtues, and I am inclined to think not without good reason, even though the influence may have been indirect. There is certainly little about the potato to suggest an aphrodisiac property. In thinking, however, over the concatenation of these four roots—viz., the eringo, and the three potatoes—as restoratives, I have been led to the conclusion that the value of them was not altogether imaginary. In the period of which I have been speaking, and still more in earlier days, the population at large was not very well fed. To a considerable extent fresh meat was a luxury; salted meat and dried or salted fish were the main animal foods of the common people, stock fish, salted and dried cod, being very commonly referred to by the comic poets. On the other hand, the use of vegetables seems to have been neglected to a large extent, and there is very little evidence of much systematic cultivation of them, except in the gardens of the well-to-do. Here and there a cabbage may be referred to, generally in terms of depreciation. Probably the cabbages of that date more resembled the cabbage of our cliffs than the great globes which nowadays are carried in hundreds of thousands to Covent Garden. That the need, however, of the use of vegetable food, in some form or other, was felt is to be seen in the fact that a great many weeds of the present day were used as or in "sallets." In fact, the notoriously great prevalence of scurvy in those days marks the effect of a diet in two ways defective, and the instinctive search for vegetable foods extended far beyond the limits of the garden of the day. That the need was in considerable excess of the supply is indicated here and there by the apparently unattractive qualities of many of the plants used. One can understand that wood sorrel, for instance, would make a very tolerable salad, and still more may it be said of the "lamb's lettuce" or "corn salad," which, though it rarely appears now at our tables in England, is still in common use on the Continent. This plant is nowadays placed with the valerians, and it may interest you to read to you Gerarde's description of it, with his dissent from this bit of classification.

"Ch. 39. Of Lamb's Lettuce or Corn Salad.

"1 Lactuca agnina. Lamb's lettuce.	2. Lactuca agnina latifolia. Corne sallad.

"The plant which is commonly called olus album or the white pot herb (which of some hath been set out for a kind of valerian, but unproperly, for that it doth very notably resemble the lettuce as well in form, as in meate to be eaten, which property is not to be found in valerian, and therefore by reason and authorities I place it as a kinde of lettuce) hath many weak stalks trailing upon the ground, with certain edges a foot high, where it grows in most fertile grounde. These herbs grow wild in the corne fields; and since it hath grown in use among the French and Dutch strangers in England it hath been sowen in gardens as a sallad herbe. This herbe is cold and something moist, and not unlike in faculty and temperature to the garden lettuce; instead whereof in winter and in the first months of the spring it serves for a sallad herbe, and is with pleasure eaten with vinegar, salt, and oil, as other sallads be, among which it is none of the worst." But when we come to such a thing as "salad burnet," we find a plant with less pleasant qualities much esteemed. It certainly has a flavour of its own, which may be attractive to some palates; but anyone who has chewed it would, I think, only regard it as food suitable for the lower animals; indeed, I should be inclined to think that it was mainly used as a flavouring in a general way. It appears to have been frequently infused in wine, to which it was said to give an agreeable flavour, and, as Gerarde puts it, a "grace in the drynkyinge."

If one walks along the shore one finds in many places the scurvy grass (cochlearia). I suppose that very few people nowadays use this plant, yet its leaves are succulent and have a slightly pungent flavour. One may see it in enormous quantities at Lymington, on low banks almost dipping into the sea, and can well understand how scurvy-stricken sailors would be eager to avail themselves of its, for them, restorative qualities. It appears to have been largely used formerly, sometimes in the form of the expressed juice put into beer, or in the form of decoction flavoured with pepper, aniseed, &c, or boiled in milk or wine. Now I venture to suggest that the potato, so easily grown and so large in its yield, offered, even while in process of acclimatisation, remarkable satisfaction to the craving for carbohydrates and vegetable juices, and that in doing so it restored the vital activities of the people who could make free use of it; in other words, that it was not in itself an aphrodisiac, but that it became so incidentally by helping to bring up men to the condition of health in which their natural instincts would assert themselves. It is, moreover, worthy of remark that in many parts of Ireland the potato is still regarded as conducing to fertility. Besides being made into pies they were cooked in other ways. I may here quote in regard to this from Lovell's "Compleat Herbal,"[2] which deals only with plants cultivated in the Botanical Garden of that University, and therefore can only apply to the common potato. "The roots are very nourishing and strengthening, and, being roasted in the embers and eaten in wine, are lesse windie; also they may be dressed with oyle, vinegar, and salt; but anyway dressed they nourish, strengthen the body, and cause lust." It appears from this passage that the potato salad so popular in Germany is an ancient institution of our own country. It has been particularly interesting to me to consider what kind of edible plants the scurvy-worn sailor would find at hand on coming on shore. The Umbelliferæ, to which family the Eringo, as you know, belongs, are singularly found of the sea shore. They are for the most part rather aromatic than succulent, yet the samphire of our cliffs has doubtless

[1] Act v., scene 5.

[2] Oxford, 1665.

formed many a refreshing dish for the mariner. For a moment let us try to enumerate a few of the Umbelliferæ which are found by the sea. Everywhere one finds the carrot, with its slightly hollowed disc of sterile white flowers and its central, velvety, brown-purple, fertile floret. Under the hot sun its foliage assumes rich colours, beautiful to the eye, but not tempting to the palate. Without cultivation its root is of no use. In the same way we may speak of the celery, the parsnip, and perhaps even the fennel, which grows so luxuriantly in the bays of our Cornish and Devonshire coasts. But besides the cabbage, the kales, and the sea-beet, there are other plants that may have come into use half in a medical, half in a dietetic way. Such are the goose-foots, the oraches, and many kinds of cress. We may be helped in understanding the old conditions by seeing what holds now in Arctic regions, where the inhabitants find a difficulty in obtaining sufficient vegetable food. The great Polar explorer, Nansen, gives some curious information as to the food of the Eskimo. His list of their vegetable foods is very limited. He states that the old Greenlanders used to eat a number of plants, among which were angelica, dandelion, sorrels, crowberries, whortleberries, and divers kind of seaweed. The angelica was apparently eaten raw. It is one of the many Umbelliferæ that grow in vast numbers in damp places and in wonderful luxuriance on our coasts. Possibly if it were blanched like celery it might be crisp as well, as it undoubtedly is, of rich aromatic flavour. It is, as you possibly know, very pleasant when candied, and lends its flavour to the liqueur Chartreuse. The Eskimo eats it as a kind of salad, well anointed with the oil from blubber. The preparation of this salad may amuse you, so I quote from Nansen in regard to it: "They also preserve the stalks of the angelica in train-oil, preparing them according to Saabye's account in the following peculiar fashion. A woman takes a mouthful of blubber, chews it and spits it out, and so continues until she thinks she has enough. When the angelica stalks have steeped for a certain time in this liquid they are taken out and eaten as dessert, with much appetite."

I adjoin another quotation from Nansen, illustrating the great need felt by these people for vegetable food: "One of their greatest delicacies is the contents of a reindeer's stomach. If a Greenlander kills a reindeer and is unable to convey much of it home, he will, I believe, secure the stomach first of all; and the last thing an Eskimo lady enjoins upon her lover when he sets off reindeer-hunting is that he must reserve for her the stomach of his prey. It is no doubt because they stand in need of vegetable food that they prize this so highly, and also because it is in reality a very choice collection of the finest moss and grasses, which that 'gourmet,' the reindeer, picks out for himself. It has undergone a sort of stewing in the process of semi-digestion, while the gastric juice provides a somewhat sharp and aromatic sauce. Many will no doubt make a very wry face at the thought of this dish, but they really need not to do so. I have tasted it and found it not uneatable, though somewhat sour, like fermented milk. As a dish for very special occasions it is served up with pieces of blubber and crowberries." Scanty as are their vegetable resources, these people do not appear to suffer from scurvy. This is probably due to the fact that they eat largely of animal food, raw, or very rarely cooked, and, as far as I can find out, never salted. They eat their fish very often frozen, and they are particularly fond of the skin of various species of whale, which is taken off the animal together with the upper layer of fat, and eaten raw. Nansen says that its flavour seems to him to suggest a blending of filberts and oysters. We may suppose that a diet of this kind may, besides being rich in fats, offer some association of carbohydrates. Our imagination may carry us from the smaller animals feeding on vegetable matter, in the sea and on its floor, next devoured by various kinds of fish and crustacea, which in turn may be supposed to be the prey of larger animals, until we come to the cetacea. So far as I know, these take no vegetable food directly. They feed only on other animals. Yet they do not have scurvy. Their teeth, when they possess them, are healthy, and their skin is delicate. The contrast between this food of the Greenlander and the salted and dried fish of our forefathers is well worth remarking in relation to scurvy. We may remember also how the Gauchos of South America live almost entirely on animal food in the form of strips of dried meat, not salted, but eaten in very large quantities, as the meat is in Greenland.

In what we may call the ascending food series, from the small animals living on the bottom of the sea, or scattered through it, to the great pelagic forms, one may certainly recognise the fact that the muscular tissues are particularly rich in a carbohydrate allied to sugar. This may be noticed in the scallop, in the crustacea, and in the rays, whose food is probably entirely animal.

Holidays are not always blessed with sunshine. Before I left the sandy bay, in which I had found so much to delight me, a mist gathered over the sky, giving rise to a halo around the sun. There were chill and dampness in the air as I made my way back in the early evening to my inn. In the night a storm of wind and rain burst upon the Land's End, utterly forbidding exit from the house. So, defrauded of the enjoyment of nature, one took to books. I had with me an old copy of the Dialogues of Erasmus, printed at Paris in 1659, and bound in vellum, an old favourite of mine. Caged in an inn I naturally turned to the dialogue entitled "Diversoria," in which two persons discourse on the ways and customs observed in the inns of France and Germany respectively some three centuries ago. The description of the German inn-keeping had always delighted me extremely, and it had also interested me very much to find that Sir Walter Scott in "Anne of Geierstein" had to a large extent appropriated this dialogue. In the order of reading, "Anne of Geierstein" had preceded for me Erasmus. The vigour of the picture, as portrayed by Scott, had made the chapter which he devotes to it very attractive. Until I read my Erasmus, I had often wondered from what source he could have found his inspiration. Doubtless the passage is familiar to many of you. You will remember the weary traveller riding up to the silent inn; the grim head, which is protruded from a small window, in slow response to many appeals; the silent direction as to where the horse is to be taken, and to the door at which the traveller is to enter; the sudden tortoise-like withdrawal of the head within the window. Within the inn the traveller finds himself one of a motley company in the hypocaust, or stove room, and learns that he and his fellow guests have to wait for their evening meal, perhaps for hours, until the host shall consider the company large enough to be entertained. Nothing will be served before that time. To every response or complaint there is one unfailing answer, "If this does not please you, seek another inn." The next inn was four leagues further. When after hours of waiting the evening feast was set before the travellers it began with various kinds of soups, with bread, cakes, or grain floating in them. Wine was also provided, of truculent acidity. A grumble regarding this brought down the infallible, "*Quære aliud diversorium.*" The unwary and inexperienced filled themselves up with these unsatisfactory viands, and the more experienced waited the arrival of more solid dishes and more generous wines, which were freely provided. The feast ended with the introduction of a cheese, so rotten as to be kept in a sort of cage, and, as Erasmus has it, "*animalculis scatens.*" When the bill had to be paid the head waiter—"*torvus ille Ganymedes,*" as Erasmus calls him—presented to each guest a score marked with chalk on a platter. It appeared that everybody paid exactly the same score, however much or however little he had eaten or drunk. After the settlement nobody was allowed to retire to his bed until the host gave the word. Scott has taken this dialogue, and, while translating parts almost textually, has dexterously woven it into the lines of his novel. It is certainly a bold bit of plagiarism. Charles Reade, in his splendid novel "The Cloister and the Hearth," has dipped into the same mine. I suppose that he had not read "Anne of Geierstein," and it is only fair to remember that "The Cloister and the Hearth" concerns the life of the father of Erasmus. In fact, "The Cloister and the Hearth" is full of passages derived from the writings of Erasmus. In comparing the adaptation of Charles Reade with that of Sir Walter Scott it appears to me that the skill of the older novelist is superior. It is something like a delicate omelette placed by the side of a beefsteak. Reade's translation is much closer: the people are brought out much more clearly, and the attributes of the cheese, probably Limburg, are presented in full relief. There is, in fact, a discussion as to how much of the cheese is really cheese, and how much cheese forming the animalcules, which is, by the way, not dealt with in Erasmus. In Reade the evening at the inn is just an episode, in Scott it is rather a telling passage in an uninterrupted story. I may add that Reade introduces the contrast between the French and German inns, greatly to the advantage of the former, portrayed in Erasmus. Scott does not let this interfere with his story. I hardly know any instance in modern times of an

appropriation by two several writers of so large a passage from an earlier writer, and yet one cannot find fault with either of them. In both books the discomforts of the old German inn fall naturally into the course of the tale, and Reade, though anticipated by Scott, had a special right to the appropriation in virtue of the subject of his novel. Both writers have clearly been guilty of "plagiarism," but our whole succession of poets and dramatists have been guilty in the same way, each one in turn "adapting," as the phrase is now, plots or passages from predecessors. What was fairly allowed to Virgil is now allowed on our stage. There is often much to while away an hour in thinking over the ancestry of many works that are better known than those from which they were derived; and, thinking again, one can see how many good old stories have been spoilt by later narrators. There are also, doubtless, coincidences in literature which have not been consciously plagiarisms. For example, the late Mr. Anthony Trollope wrote a very clever novel, entitled "The Fixed Period." The essence of the plot was that in an Australasia of the long future a Prime Minister would pass a law according to which every citizen, after attaining a fixed age, was to be put away. Massinger has a play, "The Old Law," in which men of eighty and women of sixty are condemned to death at the same sort of "fixed period." Mr. Trollope declared to me that he had never known of this play, and I fully believe him, the general incidents being entirely diverse in the two works. Milton's famous line, in which he speaks of ambition as

"The last infirmity of noble minds,"

was, if not anticipated, at all events expressed in different words by writers of the same period. As an instance of adaptation, there is a play by Beaumont and Fletcher, called "The Custom of the Country," in which a great dramatic situation occurs, almost hidden in surroundings of unutterable grossness. The situation is that a stranger to the country, having been insulted without cause by a bullying noble, fights with him and leaves him for dead. The people rise upon the stranger, and he runs to the first open house for refuge. He finds there a lady, also noble, who receives him and conceals him. It turns out that the slain man is her only son; but, having given her oath to save the fugitive, she does not give him up to his pursuers. This episode in the play, coming down through the centuries from Boccaccio, and perhaps earlier, has been picked out by a dramatist of this century, Watts Phillips, and has been made the basis of an excellent play, called "The Huguenot Captain."

I have said that adaptations have not always been equal to the original. Dryden, for instance, appears to me to have marred in some cases the stories which he re-told. In the story of Sigismonda and Guiscardo, handed down from Boccaccio, while the main lines of the very tragic story are preserved, they are encumbered with unpardonable lewdness, out of all harmony with the spirit of the story, but characteristic of the methods of the man whom people of his own time, not without reason, were wont to call "Glorious John."

Now let us find ourselves out of doors again. There is a certain old town on the coast of Dorset which has afforded me numberless and yet inexhaustible rambles. It lies at the mouth of a valley, between broad chalk downs on the north-east and a great mass of oolite on the south-west. The floor of the valley belongs to the Wealden, and beyond the downs a tertiary moorland extends for miles into the interior of the country, dotted with large, lake-like expansions of a small river, reminding one of the highlands. Within the compass of a few miles there lies before the rambler a remarkable variety of flora, and of animal life, from an abundance of land and fresh-water mollusca up to the blackcock. There one may find on the oolite the spider orchis, and the "flos Adonis" in the spring. There we may find in the valley the early purple orchis and the meadow orchis in such profusion as can hardly be matched elsewhere, mingled with cowslip and oxlip, sufficiently present to temper with their pale yellow the rich rosiness of their companions, and I have never seen the adder's tongue fern so densely massed elsewhere as in some of the meadows near the sea. There, in summer, on the downs the bee orchis and the scorched orchis abound, and later in the moorland we may find patches of the "gentiana pneumonanthe," of what is there called the Cornish heath, of the rare bog orchis, malaxis paludosa, and the bladder wort. On the sandy shore there emerges from the seemingly barren surface the already mentioned "convolvulus soldanella," with its scanty foliage and its large thick cup, streaked with delicate pink and looking almost like a choice piece of porcelain emerging from the sand. There also is the "sheep's scabious," exiguous in its proportions, but retaining its rich blue; and there, again, the small modest clumps of the radiola millegrana. All these are bosomed in the stiff prickly bent, which, rising everywhere, is striving to turn the shifting sandhills into some sort of solid opposition to the inroads of the sea.

There, again, as the sand has risen in embankments, little freshwater pools have been formed, with boggy surroundings. These are the home of the buck bean, or bog bean (menyanthes trifoliata), a plant which always seems to me to have something tropical about its character, in its large thick trifoliate leaves, and its spikes of dainty pink flowerets, with their finely divided fringe of still paler colour. It is well worth plunging knee deep into the boggy margin to obtain a few specimens of this exquisite flower. I, at least, have often done so. In the soft earth around one finds the tender bog pimpernel, contrasting strangely with the "devil's bit" scabious, the asphodel, beautiful alike in flower and fruit, the sundew, glittering and carnivorous, of which all species can be gathered, and the lesser butterwort, "pinguicula lusitanica," also probably carnivorous. Before the time of the incursion of a railway into this favourite haunt of mine I took a well-remembered walk with a companion to the nearest station, about eleven miles distant, avoiding roads, and even paths, so as to explore the country in its original state. I well remember how, coming to a dip in the land, traversed by a streamlet, I felt a great throb of pleasure on discovering a sort of hedge of the great yellow loose-strife. Now this plant, which rises to a height of three or four feet, with a pyramid of glorious yellow flowers, is called the "lysimachia vulgaris." It is not, in fact, a very common flower, although I have met with it in Dorset, at one end, and in the Cheviots, at the other end of England. I can hardly understand why it is not more common, seeing that it is easily cultivated in gardens. When we met with it the time was come when we might fairly take a short rest midway on what was a very tough walk and think about it. The word "vulgaris" as applied to a plant does not by any means indicate that it is a very common thing. The term rather recognises essentially that the plant to which it is applied is the best known of its kind, mostly by reason of one or other quality attracting notice. The term has really the same sort of value as the term "officinarum" or "officinalis" bears in relation to medicinal plants. There are other lysimachiæ far more widely spread—such as, for instance, the "lysimachia nemorum," which can be found in almost any wood in the south of England; also the creeping jenny; and, on the other hand, there is one which is very much rarer, the "lysimachia thyrsiflora," a most graceful plant, growing chiefly in moist places in Ireland. The generic name of the plant had its interest for us as we conversed about it. The word "loose-strife" is, of course, a very fair translation of "lysimachia," "the stayer of battle," yet the name is supposed to be derived from some Græco-Sicilian potentate, Lysimachus. This is not the only plant which bears the name of "loose-strife" in village wort-lore. The richly coloured spikes of the lythrum salicaria enjoy the title of "purple loose-strife." These, as you know, form in summer no small part of the glory of the banks of the Thames, and we were met by them later in our walk where it took us through a flat country traversed by numerous little dykes. Why to either of these plants has been attributed the property of stilling strife it is hard to say. While in modern botany these two plants find their places in widely separated genera, the older herbalists group them together under the head of "lysimachia," apparently because of the willow-like character of their herbage. Moreover, the œnothera was included in the same group. They seem in old times to have been gathered together around the "vulgaris" type, and the willow-like form of their leaves seems chiefly to have guided the classification. As far as I can make out their properties were limited to quieting the excitement of oxen. Gerarde writes: "Lysimachia, as Dioscorides and Pliny wrote, tooke his name of a specialle vertue that it hath in appeasing the strife and unrulinesse which falleth out amonge oxen at the plow if it be put about their yoke." If it be true that Lysimachus, the son of Agathocles, was the first finder out of the nature and virtues of this herb it is probable that the meaning of his name found ultimately its translation into an attribution of new powers.

As an illustration of the changes which London has

undergone, I find Gerarde saying that the "yellow lysimachia groweth plentifullie in moist meadowes, especially as you go along the meadowes from Lambeth to Battersey," and of the lythrum he says, "it groweth under the bishoppe's house wall at Lambeth, near the water of Thames." In fact, when I am in the museum of St. Thomas's Hospital I often think of the purple loose-strife that might have shown its virtues there now but for the intrusion of great buildings into its lowly bed. I have sometimes thought that these two plants—more or less resembling the willow, or perhaps better, the sallow, in their foliage—might have drawn their supposed peace-making qualities from their likeness to the shrub which has been in this country for years the emblem of peace and repentance at Easter-tide.

Then the walk goes on. We chat on some of the many ways in which the naming of plants has been brought about. To revert to our first excursion, How came a "stock" to be called "matthiola"? It appears to have been called after an Italian physician, Matthiolus, who lived in the sixteenth century and was of great authority as a botanist. Now about eryngium. Eryngium has a much older origin, being, according to Liddell and Scott, a diminutive of ἤρυγγος. Dioscorides has discussed the virtue of this plant without, however, indicating the source of the name. The sources of the names of plants are, indeed, very numerous. Some have been given from their forms and colours; some from their uses, culinary, medical, or poisonous. A good many from supposed likenesses in them to parts of the human body, in diseases of which parts they were supposed to have a special healing value "in respect of their signatures"; such, for instance, as pulmonaria. Certain plants, flowering at particular periods of the year, have come under the dominion of the astrologer. Others, partly from their time of flowering, from their colouring, and the shape of their flowers or leaves, have been associated with the Christian religion. And many other names have come down from classic times, or have their origin lost in the unwritten lore of the country people. It is worthy of remark that in many cases plants which seem to have no botanical affinity are woven together in their naming. For instance, in our chalky districts we find very commonly the long golden spikes of the agrimony, with its beautifully fretted leaves at the base. This is called "agrimonia eupatoria," and is much used in rustic medicine. You may often see bundles of it hanging inside the doors of cottages. There is another plant, the "eupatorium cannabinum" or "hemp agrimony," growing to a height of from three to six feet on the margins of brooks. This plant belongs to the Compositæ and has apparently very little in common with the other agrimony, except in the name "eupatorium." Here "eupatorium" comes in as the generic name in one plant and the specific name in the other. The link cannot depend upon appearance. Both plants have been used medicinally, and both for the relief of affections of the liver. It is most probable that "eupatorium" means "hepatorium," although Pliny refers the name of "eupatorium" to Eupator, King of Pontus. As a further alliance both have had repute in the cure of snake-bite. The subject of the naming of plants offers a tempting line to follow, but time intervenes. I will only say that I have lately read a very charming book called "Tongues in Trees and Sermons in Stones," by the Rev. W. Tuckwell, which has much bearing on this subject and which I may commend to you as a pleasant companion on a holiday.

The walk of which I have spoken was, as I have said, taken before direct railway communication was established between my pleasant little town and the main line. A few years later I found myself approaching it by train. As, travelling through the tertiary formation, we approached the girdle of chalk down, we passed through a cutting in which was exposed a bed of white clay, topped by a stratum of mould with a surface of grass. Between the mould and the clay was a thin white layer which looked like chalk. There was evidently something unusual here, inasmuch as the chalk should have been below, instead of above, the clay. The contrast also between the layer of mould, at least a foot to eighteen inches in depth, and the clay beneath attracted my notice, as I had just been reading Darwin's book on the "Earth-worm." My first excursion therefore after the day of my arrival, a pleasant walk of six miles, was made to this cutting. I soon found that the chalk was roughly broken, not rounded, as it might have been in some cataclysm from the adjoining hills, but apparently placed by human agency in a bed above the clay. Among the chalk, and in the lower part of the mould above, was everywhere abundance of broken pottery, of ancient type. Further exploration brought out the fact that the beds of clay were still being worked for use in pottery, the clay being shipped in large quantity to Staffordshire. My discovery was only a discovery for myself. I soon learned that in the workings clear evidence had been for some years obtained of the existence of a very large Roman pottery around the cutting I have mentioned. Many perfect jugs and vases had been disinterred, and the remains of old sheds and grinding stones had been exposed. On my walk back I saw in a window in the village adjoining a small Roman vase, doing duty as a flower pot. It seemed to me from the condition of the surface of the clay that all the growth of mould had taken place since the Roman labourer had bared it and formed his platform of chalk. So that here one had a sort of measure, in from eight to eighteen inches of thickness, of the slow up-building of a new stratum by the agency of the earth-worm. Each inch must have taken one or two centuries. I hardly think that I should have been attracted as I was had it not been for the recent reading of the splendid work to which I refer.

And now, Mr. President and gentlemen, our ramble must come to an end. In this holiday we have been, I hope, enjoying nature and books, things which, I maintain, are cognate to the genius of our profession, both in its shorter and greater leisure. The pleasure which I have drawn from both in many a holiday-time will, I trust, justify me before you in the choice of my subject. And as for books, Horace has been greatly honoured of late by a great statesman. He (Horace) is a great friend of mine. I began this oration with him, and I will end with him, but not in the "amatory way" of the great statesman. I am not original in choosing this quotation. Sterne in his immortal "Tristram Shandy" pleads in these words for forgiveness for having taken the more cheerful view of the lives of men.

> Dixero si quid forte jocosius, hoc mihi juris
> Cum venia dabis.

ON THE

DISTRIBUTION OF THE MORTALITY FROM INFLUENZA IN ENGLAND AND WALES DURING RECENT YEARS.[1]

BY H. FRANKLIN PARSONS, M.D. LOND., M.R.C.S. ENG.

THE medical history of the past four or five years has been profoundly modified by the reappearance among mankind, after a lapse of more than forty years, of epidemic influenza, a disease previously known to most of us only through the medical literature and traditions of a bygone time. The last great epidemic of influenza in this country was in 1847–48, but for the ten years following this there had still been a considerable number of deaths—over 1000—year by year, with an increase every third or fourth year. Since 1860, however, the number of deaths in England and Wales ascribed to influenza had steadily declined to a vanishing point, it being doubtful whether the few deaths so certified in ordinary non-epidemic years were properly attributable to the same cause as the epidemic disease.

In the autumn of 1889 the news came that influenza was epidemic in Russia, and later, in Germany and other parts of the Continent. The disease reached this country towards the end of 1889, becoming epidemic in London about the new year. From that time to this there have been in this country, and especially in London, no fewer than five epidemics of influenza of greater or less extent and severity, viz.: (1) in the winter of 1889–90; (2) in the spring and summer of 1891; (3) in the winter of 1891–2; (4) in the early spring of 1893; and (5) in the winter of 1893–4. The history of these several epidemics I propose to study by the aid of information derived from the Registrar-General's reports and other official sources, leaving aside the interesting questions of the origin of the epidemic influenza and its history abroad, and of the etiology, pathology, and clinical features of the disease. Unfortunately, the Registrar-General's reports do not afford opportunity for studying the distribution in time and space of the mortality from influenza in the same detail as they do that from other diseases of the zymotic class, since they do not give the number of deaths from influenza in localities less than "registration counties," or, except in the case of London, for periods shorter

[1] A paper read before the Epidemiological Society, May 16th, 1894.

than one year. There is, further, the doubt how far the deaths registered as from influenza may be taken as an index of the actual fatality from that disease. It is well known that during an epidemic of influenza the deaths from all causes, and especially from diseases of the respiratory organs, show a striking increase—an increase far greater than the number of deaths attributed primarily or secondarily to influenza itself. Again, it is probable that the number of deaths from influenza during the first epidemic of recent years may have been understated owing to the custom which had previously obtained of applying the term "influenza" to severe cases of ordinary catarrh, so that influenza was regarded as a mild disease, and death, when it occurred, was apt to be ascribed to the pulmonary or other affection by which it was immediately brought about, without mention of the original disease. In later epidemics, on the other hand, influenza had been recognised as a formidable disease, from which death might legitimately occur without discredit to the medical attendant, and there may even have been a tendency to attribute to the prevailing epidemic deaths which at other times would have been ascribed to some other cause. Another difficulty is that influenza, while it attacks persons of all ages, is especially fatal at the later periods of life. A larger mortality from influenza in one district than in another may mean, therefore, not that the disease was more prevalent, but that a larger proportion of the inhabitants of the former were elderly persons, and a smaller proportion young adults and children. Admitting, however, these disadvantages, the number of deaths certified as from influenza is, as far as I know, almost the only statistical material available for the study of the distribution of the disease, and I propose to try what lessons can be drawn therefrom.

1. The first epidemic of recent years may be said to have begun in London on Jan. 1st, 1890, though there had been a certain degree of prevalence of the disease in the metropolis in December, and local epidemics had occurred in several villages in the east of England even in November. The mortality from this epidemic, however, may be regarded as wholly comprised within the year 1890, the number of deaths in England and Wales ascribed to "influenza" in 1889—viz., 55—being less than in any previous year on record. This first epidemic in London was especially notable for its abrupt commencement, rapid culmination, and equally rapid decline. It also probably attacked a larger proportion of the population than later ones; in no subsequent epidemic, so far as my information goes, was there the same rush of patients to the hospitals, or the same strain on public services through a large proportion of the staff being disabled at one time. It was not, however, anything like so fatal as the second and third epidemics, or even the fifth. During the first quarter of 1890 the deaths in London ascribed to influenza numbered 558, of which 304 occurred in the four weeks ending Jan. 25th. During those four weeks the deaths in London exceeded the average of corresponding weeks in the previous ten years by 1958, to which death-roll an excess of deaths from diseases of the respiratory organs other than phthisis contributed 1434, so that these, with the 304 deaths from influenza, account for all but 200 of the total excess. It must be remembered, however, that January, 1890, was after the first week a remarkably mild and genial month, with plenty of sunshine and breeze, a month, therefore, in which the death-rate might have been expected to have fallen below the average instead of exceeding it, so that the total mortality due to the first epidemic of influenza in London may have been really greater than appears from the above figures. The epidemic, which had begun in some places in the south-east of England in the end of December, was general in the southern, midland, and eastern counties by the end of the first two weeks of January. In the western counties of England it occurred later in January, reaching the Scilly Isles about the middle of February. Many districts in the north and north-west counties of England also were not invaded by the epidemic till the middle of February, and there were a few remote places in hilly districts in the north and west which were only reached by it at the beginning of March. By the end of April it had everywhere subsided, though it is open to doubt whether the disease may not have been still present in a latent or sporadic form. In London there were only three weeks in 1890 in which no deaths were registered from influenza.

2. The second epidemic began about the middle of the first quarter of 1891, the disease seeming to revive independently in several different parts of the country—viz., in Yorkshire, in the counties on the Welsh border, and in some rural districts in the south of England, in Wiltshire, Hampshire, and neighbouring counties. Of the large towns the first to suffer was Hull, where the epidemic began about the middle of March. Sheffield was attacked about three weeks later, and the other large Yorkshire towns towards the end of April. It had also by the end of April reached Manchester, Birmingham, and London, and by the middle of May almost the whole country was affected. This second epidemic was very severe in many of the Yorkshire, Lancashire, and midland towns, especially Sheffield, Oldham, and Huddersfield, and in Lincolnshire and North Wales; and, indeed, it was severe generally all over England, except in the south-west counties, where it appears to have been mild. In London the total mortality reached a high figure during this epidemic, and continued above the average for a period of ten weeks ending June 27th. During this period the deaths ascribed primarily to influenza amounted to 1941, besides 373 in which it was registered as a secondary cause. During the same period the total deaths were in excess of the average of the corresponding weeks in the preceding ten years by 4815, the excess above the average of deaths from diseases of the respiratory organs amounting to 2269. Thus the excess in deaths from diseases of the respiratory organs with those ascribed primarily or secondarily to influenza make up 4583 out of the total excess of 4815 deaths, leaving 232 only as due to other causes. This great mortality was due, as also in the succeeding epidemic, to the frequency with which the disease was complicated with a peculiar and fatal form of pneumonia. This second epidemic seems to have subsided about the end of June or beginning of July; but the interval between it and the third was bridged over, according to the testimony of observers in several districts, by a succession of sporadic cases, and in London there was only one week—viz., that ending Oct. 24th, 1891—in which no death from influenza was registered in London.

3. The third epidemic, like the second, seems to have revived independently in October, 1891, in several different quarters of Great Britain. One of these was in Scotland and the northern counties of England; another was in South Wales, Cornwall, and other counties bordering on the Bristol Channel; and another again in Kent. It was epidemic in Plymouth, Bristol, and Newcastle-on-Tyne in November, where it occasioned a high rate of general mortality in November and December, 1891. In London, however, and other large towns in the south of England the epidemic did not begin until the last few days of December or the beginning of January (about the same time, in fact, as the first epidemic two years before), and in some other towns—e.g., Nottingham—not until later still, towards the end of January. The mortality from this epidemic, therefore, is chiefly comprised within the year 1892.

In London the period covered by the epidemic may be taken as the six weeks ending Feb. 13th, 1892. During this period the deaths attributed primarily to influenza numbered 1805, besides 315 of which it was given as a secondary cause. The highest number of deaths registered from influenza in any one week was 506 in that ending Jan. 23rd, 1892, a number higher than in any other week on record since the establishment of civil registration. The highest weekly number in any previous epidemic had been 319 in the week ending May 23rd, 1891. The great fatality of this epidemic, like that of 1891, was owing to the prevalence of fatal pulmonary complications, especially pneumonia; it was probably also due partly to the severe cold weather at the time. During the six weeks of the epidemic the total deaths in London exceeded the average of corresponding weeks in the previous ten years by no fewer than 5921, of which 2892 were the excess from diseases of the respiratory organs; these, with the deaths ascribed primarily or secondarily to influenza, account for 5012 out of the total excess, leaving 909 to other causes. It may here be mentioned, as probably indicating a greater readiness on the part of medical men to recognise influenza as the cause of death, that, whereas in the first epidemic the deaths attributed to influenza bore to the excess of deaths from diseases of the respiratory organs a ratio of only 1 to 4·75, in the second and third epidemics the corresponding ratios were 1 to 2·1 and 1 to 2·8. The third epidemic was especially fatal in the south-western, southern, and eastern counties of England, the large midland, Yorkshire, and Lancashire towns which had suffered so severely in the second epidemic having been as a rule only slightly affected, while in several of them influenza is said not to have been epidemic at all at this time. In most districts the epidemic prevailed during the first quarter of 1892, chiefly in January and February, and it seems

to have been generally over by the end of the quarter, though occasional deaths ascribed to influenza occurred on into the summer, and, indeed, many places are stated never to have been since entirely free from sporadic cases. In London it will be observed that no week since the end of 1891 has passed without two or more deaths having been registered from influenza.

4. The fourth epidemic of influenza (if such it can be called) differed markedly from those already described in having a far less abrupt commencement, culmination, and decline. Its course was protracted and irregular, being evidenced in London merely by a small increase in the weekly number of deaths from influenza from about the second week in January, 1893, to the second week in June; the largest number of deaths in any one week being 49 in the week ending April 8th. In fact, its course resembled rather the seasonal increase of an endemic disease than the abrupt invasion characteristic of epidemic influenza. The course, however, of the first epidemic in 1890 was somewhat similar in certain towns—e.g., Manchester and Sheffield—being mild, protracted, and irregular, whereas the second epidemic in the same towns was sudden and severe. Although in the first half-year of 1893 the number of deaths from influenza in London in any one week was not high compared with other epidemics, yet the disease continued prevalent so long that the total number of deaths from this cause was considerable, being 710 in the half-year, against 605 in the first half-year of 1890. There was, however, no accompanying increase, as in other epidemics, in the total deaths or in those from diseases of the respiratory organs, which remained below the average almost throughout the half-year, with the exception only of the first two weeks in January, which corresponded to a period of severe frost and fog. The prevalence of influenza in the early months of 1893 has been noticed in many parts of the country, but the cases appear to have been as a rule mild and not very numerous. I have not been able to make out any definite sequence of attack in different parts of the country, except that it seems to have been early prevalent in Kent and Yorkshire. The interval between the fourth and fifth epidemics was bridged over by a chain of sporadic cases in many districts, and in London the weekly number of deaths registered from influenza during the summer and autumn of 1893 never fell below 3.

5. The fifth epidemic commenced in London in the early part of November, 1893, but in several districts in the midlands, west, and north it was noticed about the middle of October, and in one village in Lincolnshire in September. In most districts its incidence was in November and December, 1893, running on in some into January, 1894. Though somewhat more prolonged, the course of this epidemic in London resembled that of the earlier ones in its abrupt ascent, its distinct culmination, and its decline, rapid at first and afterwards more gradual. Like them also, it was accompanied by an increased mortality from all causes, and especially from diseases of the respiratory organs. During the seven weeks ending Dec. 23rd, 1893, the deaths from all causes registered in London exceeded the average by 3557, while those from diseases of the respiratory organs did so by 1560. There were during the same period 590 deaths from influenza, which, with the excess of deaths from diseases of the respiratory organs, make up together 2150 of the total excess of deaths, leaving 1407 to be accounted for by other causes. (Scarlet fever, diphtheria, and whooping-cough caused a mortality in London above the average during this period.) The proportion of the deaths registered as from influenza to the excess of deaths from diseases of the respiratory system was 1 to 2·6. This epidemic is, however, generally stated to have been of milder character than the second and third epidemics, and as being without the same tendency to pulmonary complications. On the other hand, throat symptoms seem to have been a more frequent feature than in previous epidemics. The number of deaths from diseases of the respiratory organs is markedly increased during an epidemic of influenza, though it is also increased during periods of frost and fog when influenza is not epidemic. The number of deaths from diseases of the respiratory organs attains its maximum before the culmination of the influenza epidemic, and afterwards falls to the average while a considerable number of deaths from influenza are still occurring; the explanation of this is probably that many of the deaths ascribed to influenza occur from sequelæ at a somewhat late stage. The weekly number of deaths ascribed to influenza during the intervals between the later epidemics has been larger than between the earlier ones, and without breaks in the succession, indicating that the disease has become domiciled among us, in nomenclature at least. The first epidemic in 1889–90, which attracted so much attention at the time, occasioned a mortality small in comparison with the second and third epidemics, and less even than the fifth, which has recently passed over us with but little notice. The recent epidemics have all occurred in either the first, second, or fourth quarters of the year, the third quarter or later summer months being almost free. The death-rates in London from influenza, as given in the Registrar-General's weekly returns for the past four years, have been per 1,000,000 inhabitants as follow: 1890, 152; 1891, 554; 1892, 532; 1893, 347.

Having thus traced the time distribution of the influenza mortality of recent years by the aid of the Registrar-General's weekly figures for London (where the course of the disease has corresponded, I believe, pretty closely with its general course in the country), we will now turn to consider the local distribution of the recent influenza mortality in England and Wales.

Except so far as the deaths from influenza in particular sanitary districts are recorded in the reports of medical officers of health the smallest areas for which their numbers can be given are "registration counties," and the figures can only be given up to 1892. From a table giving the number and proportion to population of deaths from influenza in the several registration counties in 1890, 1891, and 1892 (of which the middle year, 1891, happens conveniently for our present purpose to be the census year), the following conclusions may be drawn:—1. The death-rate from influenza in England and Wales per 1,000,000 inhabitants was 157 in 1890, 572 in 1891, and 540 in 1892, the average annual rate for the three years being 423. 2. In each year the influenza death-rate in London approximated very closely to that for the whole kingdom; but elsewhere considerable differences are found between the death-rates in different counties in the same year, and also between the relative positions of the same county in different years. 3. In 1890 the death-rate from influenza per 100,000 inhabitants ranged from 6 in Huntingdonshire and 9 in Warwickshire to 35 in Cumberland; it was generally low in the manufacturing and mining counties of the north, but high in the hilly counties of the west and in some of the south midland counties. 4. In 1891 the death-rate from influenza exceeded that for 1890 in every county, with the exception only of Dorsetshire, and ranged from 16 per 100,000 in Dorsetshire to 136 in Rutlandshire. It exceeded 1 per 1000 in Rutlandshire, Lincolnshire, North Wales, Westmorland, and Monmouthshire, and was high also in Yorkshire, Derbyshire, Herefordshire, Shropshire, and Northamptonshire. 5. In 1892 the death-rate from influenza per 100,000 inhabitants ranged from 25 in Durham to 133 in Dorsetshire, and exceeded 1 per 1000 also in Oxfordshire, Suffolk, Hampshire, Hertfordshire, Sussex, and Herefordshire. Generally speaking, it was high in the southern counties and low in the manufacturing and mining ones of the midlands and north. 6. In many counties an inverse proportion is perceptible between the death-rates from influenza in 1891 and 1892, those counties which suffered severely in the former year having escaped lightly in the latter year, and *vice versâ*. Thus Dorsetshire, which was lowest in 1891, was highest in 1892; and in all the south-eastern and eastern counties and most of the south midland ones, as well as in Wiltshire, Devonshire, and Worcestershire, the death-rate from influenza was considerably below the average in 1891 and above it in 1892. The same would probably have been the case in other counties which suffered severely during the third epidemic—e.g., Cornwall, Somersetshire, Gloucestershire, and Northumberland—but for the circumstance that in these counties that epidemic was established comparatively early in the autumn of 1891, so that the mortality from it came partly into that year. On the other hand, Rutlandshire, Lincolnshire, Derbyshire, Warwickshire, and Yorkshire had a high death-rate in 1891 and a low one in 1892. 7. Certain counties, however, as Buckinghamshire and Northamptonshire, Herefordshire and Shropshire, Rutlandshire and Westmorland, and North Wales seem prone to a higher death-rate than their neighbours in each year. 8. Taking the average annual death-rate from influenza for three years, we find that the twelve registration counties or pro-counties in which it has been lowest are in order as follow:

Durham	26 per 100,000	population.
Leicestershire	31	,,
Lancashire	32	,,
Staffordshire	33	,,
Northumberland	35	,,
Warwickshire	35	,,

Cornwall	36	per 100,000 population.
South Wales	37	,,
Nottinghamshire	38	,,
West Riding	39	,,
Cheshire	39	,,
Gloucestershire	39	,,

In all of the above the death-rate from influenza was under 40 per 100,000. The twelve highest were in order: Herefordshire, 76; Salop, 73; Rutlandshire, 68; Westmorland, 68; Buckinghamshire, 62; North Wales, 62; Northamptonshire, 61; Oxfordshire, 59; Wiltshire, 58; Dorsetshire, 58; Monmouthshire, 57; Lincolnshire, 57. Speaking generally, we may say that the mortality from influenza was below the average in the mining and manufacturing counties in the north and midlands, and above the average in the southern and midland agricultural counties and in the hilly counties towards the west coast.

As regards age distribution the mortality from influenza in proportion to the number of persons living at each age is somewhat high in the first year of life, but declines, rapidly at first and then more slowly, to a minimum between the ages of ten and fifteen. After this period of life it increases, at first gradually, until middle life is reached, and then nearly doubling itself in each successive decade up to extreme old age. The death-rate from influenza in females is lower than that in males at every age, except between two and three and between five and ten, at which ages the deaths of females have slightly exceeded those of males. The greater fatality of influenza at the later periods of life to some extent explains the excess of mortality from the disease in the agricultural counties as compared with the manufacturing and mining ones, the former containing a larger proportion of elderly people, who remain behind, while the young adults migrate to the towns and coalfields, there also producing a large number of children. Thus the latter counties contain a larger proportion of inhabitants at the ages at which the fatality of influenza is lowest—viz, children and young adults, while fewer of their inhabitants live to old age. The difference, however, does not appear to be wholly thus explicable. Thus, taking, on the one hand, the county of Durham, which had during the three years 1890–92 the lowest proportional mortality from influenza, and, on the other hand, the two counties which had the highest mortality—viz., the adjoining and similar counties of Herefordshire and Salop, and assuming that the distribution of influenza was uniform throughout the kingdom and that the local differences in the mortality therefrom were due solely to differences in the age constitution of the population, I find that the number of deaths from influenza during the three years per 100,000 inhabitants would be in Durham 37, in Herefordshire and Salop 52. As a matter of fact, however, it was in Durham 26, and in Herefordshire and Salop 74, so that the difference in the age constitution of the population alone barely accounts for one-third of the difference in the rates of their mortality from influenza. Certain counties also in which the influenza death-rate, calculated on an age basis, comes out equal, or nearly so, have, in fact, had rates widely different—e.g., South Wales and Monmouthshire, Cornwall and Dorsetshire, Kent and Northamptonshire.

The following are the calculated and observed rates of influenza mortality in certain typical counties or groups of counties:—

County.	Death from influenza per 100,000 inhabitants. Average of 1890-92.	
	Calculated.	Actual.
Durham	37	26
Lancashire	37	32
Staffordshire	39	35
Northumberland	40	35
London	40	41
Leicestershire	41	31
Warwickshire	41	35
South Wales	41	37
Kent	46	41
Monmouthshire	41	57
Northamptonshire	46	61
Westmorland	46	68
Buckinghamshire	48	62
Lincolnshire and Rutlandshire	49	57
North Wales	51	62
Dorsetshire	51	58
Cornwall	52	36
Herefordshire and Salop	52	74

Certain differences between the proportionate mortality at different ages and in the two sexes in the three years of the series 1890, 1891, and 1892 may here be noticed. During the three successive years the incidence of the mortality has fallen increasingly upon persons advanced in life. The years 1890 and 1891 differed from nearly all previous years—epidemic and non-epidemic—in that the number of deaths of males ascribed to influenza exceeded that of females. In 1892, however, the usual proportion was reverted to, the deaths of females from influenza exceeding those of males. This is probably connected with the greater incidence of influenza mortality in the latter year upon old persons, the number of females living at the later periods of life considerably exceeding that of males.

The following conclusions may, I think, be drawn from the facts I have recorded. 1. The behaviour of influenza on its introduction to this country in 1889–90, and its rapid spread, culmination, and speedy decline to almost complete disappearance are in contrast with its behaviour in more recent years, in which the epidemics have been more protracted and the disappearance of the disease between them less complete. The former behaviour may be regarded as that of a disease newly introduced into virgin soil, while the latter resembles rather the seasonal increase of an endemic disease. 2. Influenza may assume an epidemic form at almost any time of the year, but generally during late autumn, winter, or spring, the third quarter of the year having been free in recent years. (The epidemic of 1831 occurred in London in June and July, and that of 1788 in September.) Its epidemic prevalence does not depend on any particular kind of weather, but its fatality is increased by cold weather. Of the recent epidemics those which coincided with a daily mean temperature below the average have been very fatal, while those during which the daily mean temperature has been above the average have been comparatively mild. 3. The fatality of influenza in different localities is largely influenced by the age constitution of the population, it causing most deaths in those containing the largest proportion of elderly inhabitants. The whole of the difference between different counties as regards influenza mortality cannot, however, be thus explained. 4. A severe epidemic of influenza appears to confer upon a locality a certain degree of protection against another.

EPILEPSY IN A PUERPERA WITH HYPERPYREXIA; DEATH.

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THE occurrence of convulsions attended by coma during the puerperal state creates at all times considerable anxiety in the minds of those who wait upon the patient. Ever since Simpson drew attention to the relationship of albuminuria and eclampsia medical men have properly recognised the meaning of the swollen legs in the latter months of pregnancy, the headache, dimness of vision, and the presence of albumen in the urine. Thus forewarned, they have been led to anticipate the eclampsia, or they have carefully dieted the patient and perhaps have thus succeeded in warding off an attack. Much as epilepsy and eclampsia resemble each other—and it is more in their outward manifestations that this is observed than in the history of the seizure—there yet occurs now and again a case in which the convulsive seizure must be regarded as purely epileptic, and therefore slightly different from eclampsia associated with albuminuria. Convulsive seizures in puerperal women are more frequently due to eclampsia associated with the presence of albumen in the urine than to ordinary epilepsy, although it must be admitted that the eclampsia bears no relation to the amount of albumen in the urine. In the belief that the subjoined case belongs to the category of ordinary epilepsy its publication may not be without interest.

On May 20th, 1893, I saw, in consultation with Dr. Samuel Macaulay of Newcastle-on-Tyne, a woman twenty-eight years of age, who on the afternoon of the previous day had been delivered of her third child. The patient had an excellent family history and had enjoyed good health until nine days after her first confinement four years previously, when she had her first epileptic fit. She had a succession of fits at this particular time and was very ill. No albumen was found in the urine. She subsequently made a good recovery. During her second pregnancy, beyond several

"peculiar fainting attacks," evidently petit mal, nothing of the nature of convulsions occurred when the child was born. It was in her third pregnancy that Dr. Macaulay and I saw her for the first time. During the period that patient was carrying the child she was nervous and rather despondent, inclined to take a gloomy view of her prospects, was easily worried, and irritable. Her husband said that she had no convulsions, but peculiar attacks which he regarded as "faints," during which, whether sitting or standing, eating or talking, she would suddenly become pale, her eyes fixed, and for a moment or two there was unconsciousness. Frequently she would have fallen had some one not been near to catch her and lay her down. There was no vomiting, but headache was complained of. There had been no dropsy anywhere; she was acutely sensitive to pain. On May 17th, two days previous to her confinement, a sample of urine was sent to Dr. Macaulay, who found it perfectly free from albumen. During the afternoon of May 19th labour came on rather precipitately, the child being born before the arrival of her medical man. Seven hours after her confinement, and when everything appeared to be progressing favourably, she had a convulsion. This was succeeded by five or six fits in as many hours. When I saw her at 11 P.M. on the 20th she was lying in a dazed condition, out of which she could be roused. Her pulse was 80, soft, and there was no heightened arterial tension. The tongue was swollen, having evidently been bitten, and the pupils were semi-dilated and equal. The heart and lungs were healthy. The lochia were abundant, the breasts were flaccid, and milk was absent. Urine had been passed involuntarily. By means of a catheter three ounces of urine were drawn off, which on examination was found to be free from albumen. The temperature was 101·2° F. Bromide of potassium was given by the mouth and rectum, and sinapisms were applied to the loins.

May 21st (forenoon).—The patient passed a good night until 3 A.M., when the fits, which had been in abeyance, returned and continued until 10 A.M. When we saw her again at 3 P.M. she was in a fit of a very severe character. The pupils were widely dilated and equal, the pulse was 120, and the temperature was 101°. A turpentine and warm water enema had been given, and the bowels had freely acted. At 8 P.M. she was having fits every quarter of an hour. Consciousness had not been regained for several hours. It was noticed that the face now remained longer pale, that the pupils, whilst being equal, were contracted after the fits, and that there were numerous râles in the chest; the pulse was 160, the temperature being 101·5°. The urine withdrawn by catheter was free from albumen. Bromide and chloral were injected per rectum.

22nd (10 A.M.).—The patient has had no fits since last night, but she lies in a heavy, comatose state; the pulse is 140, the temperature 104°; the pupils are small and equal; loud, moist râles can be heard in the chest; the patient passes urine involuntarily, and the lochia are normal. Twenty grains of antipyrin were injected per rectum.—8.30 P.M.: After the injection of antipyrin the temperature fell to 103° and then to 102°, but to-night it has risen to 104·2°; the pulse is 162, the respirations 60 per minute. She is still comatose; the pupils are extremely contracted—almost pin-pointed. By means of a catheter about a pint of light amber-coloured urine was withdrawn which was free from albumen and sugar; sp. gr. 1022, acid; it contained 9·8 grains of urea to the ounce.

23rd (10 A.M.).—The patient is still unconscious; the pupils are extremely contracted; the face cyanosed and dusky as well as pale; the pulse is 164, the respiration 60, and the temperature 103·2°. Urine is passed involuntarily, but is apparently plentiful; the lochia still flowing, but scanty. Our attention is drawn to the fact that for the last few hours the temperature has been gradually rising. The patient died at midday. The temperature was 109° ten minutes before she died.

The temperature record is interesting. May 22nd: 8.30 P.M., 103·2°; 11 P.M., 104°; 12 P.M., 104·4°. 23rd: 1.20 A.M., 104·2°; 2.30 A.M., 104·2°; 3.45 A.M., 105·2°; 4.30 A.M., 105·4°; 6.30 A.M., 105·6°; 8.30 A.M., 107·2°; 10 A.M., 108·2°; 11.50 A.M., 109°.

There was nothing at all in the case to indicate the presence of puerperal septicæmia, and the absence of albumen in the urine from first to last takes it out of the category of ordinary puerperal eclampsia. The early development and the persistence of unconsciousness, the extremely contracted pupils, and the hyperpyrexia rather led us to infer the possible existence of miliary cerebral hæmorrhages or of effusion. Unfortunately we were unable either to verify or disprove this—a necropsy, though asked for, having been refused. The pathology of the convulsive seizures of puerperal women has always been an interesting one for discussion. Occuring, as the fits do, at a period in the life history of a woman when her mental and arterial tension are great, and the expectancy and curiosity of her friends are running high, sudden as they are in their onset and frequently fatal, it is not surprising that during the past, in both the lay and medical mind, opinions should have been formed that gradually rooted into beliefs for which no true reason could be given and for which no series of well-established facts had been forthcoming. In this particular instance imagination has always been far in advance of actual fact. Epilepsy has for long been a curse to the human race, wrecking often some of the finest intellects and burying others ere they have had time to develop. As it occurred in primiparous women until then perfectly healthy, and was observed to disappear after recovery from the confinement only to return at or after the birth of the second child and in succeeding pregnancies, it was not unnatural that both the laity and the medical profession should have come to regard pregnancy as the cause of epilepsy. When we consider the numerous causes of epileptiform seizures that end in unconsciousness—e.g., uric acid as shown by Dr. Haig, plumbism, imperfect renal function allowing of the retention of animal poisons in the blood, &c.—there is no reason why the disordered blood of pregnancy, with its altered arterial tension and plethora, should not so influence the cerebral centres as to lead to the nervous explosion upon which the fit depends. In the case just reported the patient, in whom there was no family tendency to epilepsy, was perfectly healthy until the birth of her first child. From that period until her second parturition she remained quite free from the attacks. The urine examined before and after her confinements, and during the period she was suffering from the seizures, remained free from albumen. Without unduly insisting that in her case pregnancy was the cause of epilepsy we admit that in the absence of albuminuria there must have been circulating in her blood poisons of an animal nature which were imperfectly eliminated. And these, apart from any special predisposition on the part of nerve centres, may have exerted a certain influence in the development of her illness. Without absolutely believing in the two things as cause and effect I see no reason for doubting the connexion of pregnancy and epilepsy, any more than that of pregnancy and chorea—in which, as we know, once chorea develops in the course of a pregnancy the motor disorder is almost certain to reappear, not only in succeeding pregnancies, but nearly always at the same period of utero-gestation. Under any circumstances it is unlikely that any medical man will meet with a large number of cases similar to the one I have reported, and in my own particular case it is extremely unlikely, as I am not engaged in ordinary obstetric practice, but the records of such cases by medical men who have an extensive midwifery practice, even if regarded by them as simply the coincidences of pregnancy, would help us to a conclusion upon some of these interesting points. Only a few years ago I was consulted by a lady who experienced her first epileptic fit in the early months of her first pregnancy. The process of parturition then, and subsequently, has been accomplished without any reappearance of her illness at this particular time. Immediately, however, impregnation occurs, the patient invariably has a severe epileptic fit, attended by loss of consciousness, and so fixed in her own mind has the relationship of conception and epileptiform seizure become, that she has in her later pregnancies dated the commencement of her condition from the time of the seizure, made her calculations accordingly, and, it may be added, always correctly. Here there is no question of altered blood, but in one way or another some impression is made upon the nervous system.

So far we have seen that pregnancy may be a possible cause of epilepsy in those whose nervous system is predisposed and thus specially prone to react to the abnormal conditions under which it is nourished. Is the converse of this at all probable? The older physicians—Velpeau, Tyler Smith, Maissonneuve, and others—were of opinion that pregnancy tended to ward off epilepsy, a belief shared by Dr. Gowers, who, in his "Diseases of the Nervous System," says that "in most cases of epilepsy the attacks do not occur during the puerperal period." In some of my own cases there has been an abeyance of the seizures during pregnancy, whilst in others the attacks have come

and gone just as they did before marriage. In a few the attacks have been slightly aggravated. We require a large number of authentic cases carefully investigated before we can express a definite opinion upon this particular point. At present it is wiser for us to withhold our opinion, for if the laity are encouraged to believe that pregnancy exercises an influence for good upon epilepsy, women who are the subjects of the malady may be induced to marry, and we can scarcely regard this as in all cases desirable, or that the procreation of children under such circumstances is unattended by risks.

Newcastle-on-Tyne.

ON SYPHILITIC AFFECTIONS OF THE SPINAL CORD.

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IT is reasonable to suppose that syphilis may affect the spinal cord as readily and in as many different ways as it does the brain. *A priori* there is no inherent improbability in this being the case, and in cases of spinal cord disease in which the cause is obscure it is necessary to bear in mind the many modes of action of syphilis on the central nervous system. A group of cases which have lately been under my care at the Bristol Hospital have impressed upon my mind the importance of syphilis as a cause of disease of the spinal cord, and have made me ponder whether the frequency of syphilis as a cause of some diseases of the cord is not under-estimated. Speaking generally, syphilis, when it attacks the central nervous system, seems to affect the brain rather than the cord, or perhaps it would be more correct to say that the direct effects of syphilis on the nervous system are most strikingly exhibited in affections of the brain. On account of the seat of the disease syphilitic affections of the brain are often fatal, their consequences can be followed up at the necropsy, and the connexion between morbid process and symptoms distinctly traced. On the other hand, death does not often occur as a direct result of syphilitic disease of the cord, and when the fatal termination does occur, after a longer or shorter interval of time, the immediate interest of the question of the causal action of syphilis has passed away, and the importance of the point is apt to be forgotten, or the patients drift away from the hospital and a post-mortem examination is not obtained, or in the course of the disease such extensive secondary changes have taken place as to mask the original cause of the malady. Thus the evidence of the syphilitic origin of diseases of the spinal cord, being founded more frequently on clinical than on pathological data, is not, except in the case of the occurrence of typical syphilitic gummata, so clear and decisive as it is in cases of cerebral syphilis. It is hardly necessary to say that a person suffering from syphilis or its consequences may present symptoms of spinal cord disease of independent origin, and, further, that when cure occurs in diseases of the cord as the result of treatment by anti-syphilitic remedies, it is not a proof that such disease is syphilitic, for both mercury and iodide of potassium have some effect in other disorders of the nervous system by aiding in the absorption of inflammatory products. An aid in the diagnosis of syphilis as the cause of an affection of the spinal cord is afforded by the presence of collateral syphilitic lesions in other parts of the body, and the probability is greatest when the other part attacked is the brain, indicating that in the case in question the syphilitic poison has already shown a tendency to invade the nervous system. If, however, it can be shown that a particular disease of the cord only occurs in the subjects of syphilis, or, at any rate, that an overwhelming majority of the sufferers from the disease have also had syphilis, in such a case, although the connexion between syphilis and the malady in question may be a remote and not a direct one, the evidence that the latter is the result of the former is very strong. This method of proof by exclusion has now been accomplished for tabes dorsalis, which may probably be regarded as due to degeneration in the nervous tissues arising from a modification of the metabolic processes of the body from the effect of the previous action of the syphilitic poison. As Dr. Gowers expresses it: "The degenerative changes in the nervous system differ from the lesions of active syphilis both in character and time in such a way as to make the assumption reasonable that they depend upon some product of the growth of syphilitic organisms, a product which may possibly be a chemical substance—a suggestion first made by Strümpell, and widely held regarding other analogous maladies." Whatever view may be held as to the exact action of syphilis in producing tabes dorsalis, the causal connexion between them must now be considered proved, and must considerably extend the conception of the part played by syphilis as a cause of nervous disease; for there is nothing, so far as is known, in the constitution of the posterior root zones and posterior columns which should render them exclusively liable to suffer from the remote action of the syphilitic poison, and it is possible that other of the so-called primary degenerations of other tracts in the cord may be found to be caused by syphilis. Primary spastic paraplegia and combined system degenerations (ataxic paraplegia) are such diseases of degeneration of particular tracts in the cord; but for these two maladies the evidence of syphilitic origin is not to hand. In the eight cases of these affections that I have seen four patients had had syphilis, three had not suffered from it, and in the other case it was doubtful. Again, it is well known that syphilis may excite inflammatory processes which are indistinguishable from inflammations due to other causes, and, further, the originally syphilitic nature of the process may be entirely unrecognisable amongst the more conspicuous secondary changes produced. Take as an instance the results of the occlusion of an artery which is the seat of syphilitic endarteritis. The effect of such an occlusion in the central nervous system is to cause a destructive necrosis of the area supplied by the vessel, and these changes may effectually mask the cause of the softening so that this may be regarded as the primary instead of the secondary process. Moreover, such a lesion could not be distinguished macroscopically from the results of the occlusion of the vessel from any other cause, and only the presence of other undoubted syphilitic lesions or the microscopical examination of the tissues would lead to the discovery of the true nature of the mischief. The difficulty of diagnosis is not always over even when the case comes to the post-mortem table. Clinically such a case could be recognised as syphilitic if it was ascertained that a certain group of symptoms, though also occurring in non-syphilitic patients, was found with especial frequency in the syphilitic, and in the latter was speedily and repeatedly relieved by anti-syphilitic remedies. Some effects of syphilis on the cord are certain: these are the formation of gummata in the membranes or the cord itself; pachymeningitis hypertrophica, with its almost invariable seat in the lower cervical region; tabes dorsalis as a remote effect of syphilis stands on somewhat different grounds. Occasionally the syphilitic process is confined to one particular set of fibres or group of cells having a special function, and symptoms are produced such as those of acute locomotor ataxy if the posterior columns, or of rapidly progressing muscular atrophy if the anterior cornua are involved. Thus in one case under my care there were the symptoms of progressive muscular atrophy of the common type.[1] The patient was a man aged thirty; the muscles affected with atrophy were those of the right thenar eminence, of the small muscles of this hand, and the abductor indicis. There were no sensory symptoms, the disease was progressive, and the abductor indicis of the left hand was also beginning to be affected. He recovered under anti-syphilitic treatment. A year afterwards he came back with a recurrence of the muscular atrophy in the same muscles of the right hand. He came for treatment earlier than before, and the atrophy had not advanced so far. He again rapidly recovered under the influence of iodide of potassium and mercury, and I then made him go through a prolonged course of treatment by these drugs, and, so far as I know, he has remained well ever since.

Besides the above well-recognised types of syphilitic disease of the cord there is a large group of cases of meningitis, myelitis, or meningo-myelitis, in which the agency of syphilis is probable, but not so distinctly proved. Syphilis is well known to cause meningitis, but the part played by it in the production of myelitis requires further consideration. In the first place, and probably by far most frequently, myelitis of specific origin is caused by extension from meningitis. There is first a meningeal inflammation of the ordinary syphilitic character, and the cord itself is subsequently

[1] Bristol Medico-Chirurgical Journal, September, 1888.

affected partly by pressure and partly involved in a syphilitic infiltration. Secondly, syphilis is often the cause, perhaps the most frequent cause, apart from injury, of a focal transverse myelitis extending completely through the whole thickness of the cord for a short distance. Thirdly, it has been shown that syphilitic endarteritis occurs in the cord and its membranes, and in the former such an arteritis would cause softening in the area supplied by the vessel. The present knowledge of myelitis is unsatisfactory. Apart from injury its causes are obscure, and those generally assigned, such as exposure to cold, over-exertion, and sexual excesses, are, to say the least, doubtful. The actual mechanism by which such causes could produce a lesion like myelitis is very obscure. Is myelitis to be considered as a true inflammation, or is it a softening or necrosis of the tissues brought about by vascular occlusion, and are the inflammatory changes found in the affected parts merely a secondary result of this? If the latter is the case, must the occlusion of the vessel be complete, or is extreme narrowing of the arteries from vaso-motor spasm of a certain duration sufficient to excite changes in the direction of softening in the area supplied by them? These questions are at present unsolved, but if myelitis is due to vascular occlusion then the endarteritis of syphilis supplies a cause for it. Apart from actual occlusion of vessels necrosis is known to take place in other tissues as a consequence of the action of an intensely irritant poison. The myelitis of the specific fevers might be explained in this way, and this explanation would hold good for a syphilitic virus of unusual intensity. That myelitis often occurs in persons who have had syphilis is known, and, referring to my notes of cases, I find that, of five men suffering from meningo-myelitis, all were syphilitics; of eight cases of ordinary myelitis in men five certainly and one probably had had syphilis; of three women not one had had syphilis; and one man with transverse focal myelitis was syphilitic; or of seventeen cases ten had had syphilis. I did not know until I looked up my notes that the proportion of patients with syphilis was so high. The inquiries as to syphilis were made in all the cases as a matter of routine in investigating diseases of the cord, and not with regard to any opinion, negative or positive, as to a connexion between syphilis and myelitis. Of course I do not lay any undue stress upon the actual figures in such a small number of cases. Syphilitic endarteritis may presumably account for some of the cases of myelitis of sudden onset, and for those in which an acute and not a chronic (progressive) onset ushers in symptoms which indicate that the lesion is limited to one side of the cord and in vertical extent to one or two segments. Thus the group of symptoms first produced experimentally by the late Professor Brown-Séquard, which consists of motor paralysis with some hyperæsthesia over the trunk and limb on the same side of the body below the lesion, together with defect of sensation without motor paralysis on the opposite side, is occasionally met with clinically, and when not the result of injury is, as a rule, due to syphilis. In specific diseases of the cord the inflammatory disturbances at first excited cause symptoms of wide distribution, which afterwards subside and leave those which are to persist as the result of the original lesion. In such cases of meningo-myelitis it would be useful if it could be proved that there is a grouping of symptoms which indicate that a given case is one of specific disease of the cord. It has been remarked by Jürgens[2] that in syphilis of the central nervous system the symptoms often follow a descending course—that is to say, that the first signs are those of cerebral meningitis, e.g., paralysis of cranial nerves and headache, followed by those of meningitis of the upper and subsequently of the lower parts of the cord, and this meningitis again by those of myelitis, of extension of the disease to the cord itself. Symptoms at first of widely distributed mischief, afterwards reduced to the more localised persistent affection. Since meningitis is so frequently the precursor of myelitis, and in meningo-myelitis the lateral columns are first attacked, the frequent occurrence of the signs of degeneration of these columns—i.e., exaggeration of deep reflexes, clonus, and spastic rigidity of muscles—is to be anticipated, and, as a matter of fact, is very common in these particular syphilitic affections of the cord. There is also a class of cases of meningitis in which the pains arising from pressure make the disease resemble paraplegia dolorosa. Professor Erb has lately formulated a group of symptoms which he considers to be pathognomonic of syphilitic spinal cord disease. These are: (1) the usual symptoms of spastic paraplegia, with its peculiar gait, carriage, and movements; (2) great exaggeration of the reflexes, predominating out of proportion to the muscular contracture present; (3) bladder troubles; (4) slight, but distinct sensory disturbances; (5) gradual onset; (6) tendency to improvement. The above summary of Erb's views is taken from a paper by Dr. Sachs,[3] who adds these further characterisations: (1) distribution of the disease over the greater portion of the cord, cervical, lower dorsal, and lumbar portions; (2) the relatively slight intensity of the morbid process compared with the extent of area involved; (3) rapid dwindling of some of the symptoms and chronic persistence of others; (4) frequent history of other symptoms pointing to specific disease in the same or other parts of the central nervous system. These forms of syphilitic disease of the cord are generally preceded by a premonitory period[4] in which sensory troubles predominate. Spinal pains more or less radiating in character, at first vague then localised in one spot, various paræsthesiæ in the limbs, localised headache with nocturnal exacerbations, and paralysis of cranial nerves are the chief symptoms. The length of time that elapses between syphilitic infection and the onset of the spinal symptoms is variable, varying from some months to several years. The prognosis is fairly good as to a considerable degree of recovery if treatment is begun early, but I have only seen one case in which the recovery was anything like complete. If necrosis or complete degeneration of the nerve elements has followed the total occlusion of a vessel, or the pressure of gummata or meningeal exudations, there is no means of recovery, but it is reasonable to suppose that definite symptoms arise long before the nervous tissues are completely destroyed and when they are capable of repair if the prime cause of the mischief can be removed. Fortunately if the nature of the case is recognised sufficiently early the latter condition obtains, and hence the large measure of recovery; but if the disease has lasted some time, then, although a part of it may be removed, much must be irremediable, and the patients remain considerably disabled.

The following cases of myelitis and meningo-myelitis were, so far as could be ascertained, of syphilitic origin and illustrate the symptoms and course of this affection when due to syphilis as given above:—

CASE 1. *Meningo-myelitis (dorsal region); Brown-Séquard's syndrome.*—The patient was a single man thirty years of age who had been infected with syphilis for ten years. There was no other case of paralysis in his family. The illness began at Christmas with violent headaches, worse at night, and pains in the calf of the right leg like a sprain. Shortly afterwards he lost power, first in the right leg and then in the left, and took to bed; after three or four weeks there was some improvement, but he soon relapsed. He had been in bed with absolute paraplegia for three months; in addition there had been various paræsthesiæ and some anæsthesia in the legs, and excruciating pains between the shoulders passing up to the occiput. There had been incontinence of urine during the last two weeks before he was admitted to hospital; a sacral bedsore had troubled him for ten weeks. On admission to hospital on Aug. 19th this sore had just healed. There was almost complete paraplegia, the patient just being able to move the left toes. The arms were unaffected. Any movement caused pain in the back. A zone of hyperæsthesia passed round the body at the level of the fourth to the eighth ribs; below this on the trunk there was some hyperæsthesia on the right and anæsthesia on the left side; except over the front of the leg the skin of the right lower extremity was hyperæsthetic; the left lower extremity showed everywhere diminished or absent sensation (touch, pain, and temperature). As he lay in bed the right leg was flexed at the knee, the left extended. Abdominal and cremasteric reflexes absent. There was no rigidity; complete loss of muscular sense in both legs; right knee-clonus; no ankle-clonus. He was obliged to pass water immediately he felt the desire to do so, or the bladder emptied itself involuntarily. Any irritation of the skin caused him to pass urine. There was no tenderness over the spinal column, which appeared normal. The abdominal muscles were unaffected. Electrical reactions showed no marked change either for

[2] Ueber Syph. des Rückenmarks und s. Haute. Charité Annalen, 1885, p. 729.

[3] Journal of Nervous and Mental Diseases, May, 1893.

[4] H. Lamy: De la Méningo-myélite Syphilitique. Nouvelle Iconog. de la Salpêtrière, No. 4, 1893.

nerves or muscles. Under strict anti-syphilitic treatment and, later, electrical treatment and massage he made steady improvement, and he can now stand and walk with the aid of a stick and has fair power over his bladder, though he occasionally wets the bed at night. The left leg has recovered far better than the right; the muscles of the latter are now stiff and rigid, showing well-marked "clasp-knife rigidity," and there are ankle- and knee-clonus. There is no rigidity of muscles in the left leg and no clonus; the knee-jerk is brisk. There is still deficient sensation in the left foot and leg and slight hyperæsthesia in the right.

CASE 2. *Syphilitic meningo-myelitis.*—The patient was a man twenty years of age. There was no other case of paralysis in his family. The patient had contracted a sore on the penis, which eight weeks before admission was followed by sore-throat and an abscess in the groin. On Aug. 11th he felt slight weakness of the legs, and on the next day was attacked with sudden pains in the loins and knees, the latter giving way under him; the pain was followed by numbness and tingling. He was just able to crawl up to bed and remained there until he was admitted into the hospital on Aug. 14th, 1893. There was no affection of micturition. On admission to hospital there was almost complete paraplegia, the patient being only able to raise the feet about an inch off the bed. There was considerable loss of sensation over the legs and trunk, greater to touch than to pain (pin-prick), below a line at the level of the ensiform cartilage in front, and chiefly below the level of the tenth, eleventh, and twelfth dorsal spines behind. Above this level sensation was deficient over the back to the level of the second dorsal spine. Sensation was unimpaired over the back of the left thigh. Plantar and cremasteric reflexes were absent; the abdominal reflex was active; the knee-jerks were normal; there was no ankle-clonus. There was no affection of the bladder or rectum. The cranial nerves were unaffected. The pupils were equal, but the left reacted slowly to light. The special senses were normal. The spinal column was normal. There was a small bedsore behind the left trochanter, and some enlarged and very hard glands in the left groin. The muscles were flaccid, but there was some spasm of the long extensor of the left great toe. There was slight loss of irritability to the faradaic and increased irritability to the constant current in the leg muscles generally. Under anti-syphilitic treatment only he rapidly improved. On Sept. 2nd he could stand and with support could manage to walk a few steps, but the legs felt stiff and rigid. The muscular irritability in them was decidedly increased; the knee-jerks were active; there was double ankle-clonus, and the plantar and cremasteric reflexes had returned. Sensory disturbance was still present, but less marked. On Sept. 14th there was further improvement. There was now loss of sensation only in scattered areas over both legs—namely, over the front of the right thigh, the knee, the upper third of leg, and over the popliteal space and heel behind; also over the upper third of the front of the left thigh. He was much stronger and from this time made rapid progress, so that he was soon able to walk moderately well and was discharged. The ankle-clonus had disappeared, and there was no rigidity; the knee-jerks were rather excessive.

CASE 3. *Syphilitic myelitis (diffuse).*—The patient, a single man fifty-one years of age, contracted syphilis ten years ago, and had been a heavy drinker. There was no history of nervous disease in his family. In 1876 he had typhoid fever, and delirium tremens in 1878. For twelve months he had suffered very much at times from neuralgic headache, generally nocturnal; it had been worse during the last two months. The sight failed gradually in the left eye, and he then suffered from diplopia and complete left ptosis of two weeks' duration. After the ptosis passed off he became and has remained quite blind in the left eye. He remained at work six weeks before he was admitted to hospital, when gradually increasing weakness of the legs came on, with severe cramping pains in the calves and retention of urine. On admission, on Aug. 21st, 1893, he could just stand with support, but could not walk; lying down he could raise the right leg half an inch off the bed, and the left not at all. The abdominal and plantar reflexes were present, the cremasteric absent. The right knee-jerk was normal, the left was absent. He was unable to pass his urine. The arms were unaffected. There was paralysis of the left external rectus; the associated movement of the eyes in looking to the right was the only movement present in the left eye. The left optic disc was atrophied. The only loss of sensation was a slight loss to prick and touch over the right thigh and right side of the abdomen. During the following week (on the 28th) the patient became worse and the loss of power in the legs absolute; there was now complete incontinence of urine and fæces. At this date loss of sensation was complete below the nipples, and from a corresponding level on the back over the trunk and lower extremities. The reaction of muscles to the constant current was unaltered; to the faradaic a strong current was required, and this gave rise in the left anterior tibial muscles to a peculiar, long, slow wave of contraction. He suffered from a good deal of twitching of the muscles and from starting of the legs at night. Subsequently the leg muscles became affected with spasmodic rigidity, with a tendency to flexion of the limbs. The left knee-jerk was absent, the right active, and there was no ankle-clonus. Incontinence of urine and fæces continued, and bedsores formed on the right gluteal region and behind the left trochanter. Sensation returned over the left thigh and to some extent over the left side of the trunk, but in other respects the condition remained unaltered, paraplegia being complete. The patient is now quite free from pains in the back and from radiating pains in the limbs.

CASE 4. *Syphilitic meningo-myelitis (meningitis).*—A seaman thirty-nine years of age, married, had had no illness until 1864, when he had yellow fever. In 1870 he contracted syphilis. He had always indulged most excessively in alcohol and sexual connexion. In 1891 a heavy bag of sand fell upon his back, and he was laid up for a week with loss of power in the legs, from which he recovered completely. In January, 1892, he was admitted into the Bristol General Hospital for pains in the right thigh, due to a gumma situated in its upper and outer part; it disappeared quickly under treatment. In April he was again admitted for pains in the loins and over the lumbar spines, so severe as to prevent him from walking; he had at this time priapism for two days. He insisted on leaving the hospital on May 7th, but soon got worse again and was readmitted on July 28th, when his condition was as follows. He complained of excruciating pains in the lumbar spine and up the back, with pain passing round the abdomen as if he was bound with a rigid bar. The dorsal and lumbar spines were intensely tender. A zone of hyperæsthesia encircled the trunk from the level of the eighth rib above to the umbilicus below, and below this there was anæsthesia. He was able to flex the left knee a little, but otherwise had lost all power in the legs. There was excessive irritability of muscles, and they were affected with spasmodic rigidity. The knee-jerks were exaggerated: there were left knee- and ankle-clonus. The plantar reflexes were active; the abdominal and cremasteric reflexes were absent. The urine was retained and there was obstinate constipation. The arms were unaffected and there was no sign of paralysis of any cranial nerve. The pupils were equal and acted well. During the course of his illness he suffered from intense pains in the back and radiating pains round the trunk, and from painful hyperæsthesia over the buttocks and outer side of the left thigh. There was some tremor of the left arm at one time, which, however, passed off. Retention of fæces gave at first much trouble, but this after the first two weeks was succeeded by incontinence. After three weeks' anti-syphilitic treatment he began to improve and then grew rapidly better; he lost his pains, regained control over micturition and defæcation, and could stand and walk a short distance one month after admission. His gait was at first very ataxic, and the muscular rigidity and exaggeration of reflexes was still marked. He left the hospital on Sept. 19th and then could walk fairly well; there was no ankle- or knee-clonus, but the knee-jerks were exaggerated and the muscles rather rigid. He gave way to excesses on going out and returned about four months later suffering again from pains in the back and symptoms of spastic paraplegia with incontinence of urine. The symptoms were less severe than before and after treatment by iodide of potassium and rest for three weeks he rapidly recovered and left the hospital.

CASE 5. *Hemi-paraplegia in a patient who had had syphilis (? endarteritis).*—A man forty-four years of age, who had had syphilis, was seized with pains in the back and loss of power in the right leg. The muscles of the right leg and calf were rigid and showed some fibrillar trembling; there was no wasting of individual muscles, but the limb measured one inch less than the left in circumference. There was no loss of sensation. The muscles of the right leg reacted more readily than those of the left to interrupted and constant currents. Ankle- and knee-clonus on the right, none on the

left side; left knee-jerk lively. Plantar and gluteal reflexes were absent on the right side, present on the left. This condition of paresis of the right leg remained permanent; there was no change when he paid me a visit eighteen months afterwards.

CASE 6. *Hemi-paraplegia in a syphilitic patient (Brown-Séquard's syndrome)*.—A navvy fifty-nine years of age was filling waggons, when he had to "give up" on account of soreness and pain in the right arm; in the afternoon he lost the use of his right leg, and next day a feeling of numbness, "as if he were frost-bitten," came over his left leg and foot, and left side of the lower half of the trunk. He had been exposed to wet and cold for fourteen days previously. The arm recovered at once, and when I examined him three weeks after the onset the arms and upper part of the body were normal. The organs of the chest and abdomen appeared to be healthy. There was considerable loss of power in the right lower extremity and at the hip- and knee-joints, and in the ankle and toes only an inconsiderable degree of movement was preserved, but he could walk with the aid of crutches. There was no atrophy of muscles; sensation was very acute, he could feel the stroke of a hair everywhere over the whole limb. There was no paralysis in the left leg, but sensation was deficient generally, and almost absent over the calf, the toes, and outer side of the thigh. No loss of muscular sense was made out in either leg. The knee-jerks were both very brisk; plantar and cremasteric reflexes could not be obtained, but abdominal reflexes were present. There was neither ankle-clonus nor muscular rigidity; micturition was unaffected There was no pain after the onset. Under treatment with iodide of potassium and blistering over the lumbar spine he made a rapid recovery and returned to work in January; the knee-jerk was then decidedly more active on the right side than on the left, and the plantar and cremasteric reflexes were still absent; otherwise he had regained strength and sensation.

With regard to treatment I need only add that the most effectual seemed to be the combination of mercurial inunctions with full doses of iodide of potassium internally, and that, as soon as the acute symptoms have subsided, massage and electrical treatment hasten recovery.

Clifton, Bristol.

DYSTOCIA FROM OCCLUSION OF CERVIX UTERI.

BY B. HUBERT J. GARDINER, M.D. ST. AND., L.R.C.P. EDIN., M.R.C.S. ENG., L.S.A.

CASES of dystocia from occlusion of the cervix uteri are, I think, sufficiently rare to warrant me in giving the following particulars of a case recently under my care, and acute lymphatic septicæmia starting with apparently an autogenetic origin, as in the second case, is also, I think, unusual, more especially as many of the symptoms are not commonly met with in such cases, nor is the ultimate result often as favourable. I hope that the following brief account of them may be of interest to the profession.

CASE 1.—A primipara thirty-two years of age, married two years. With the exception of an illness two months after marriage, which was supposed to have been due to a miscarriage, the patient had enjoyed good health. She then suffered much from persistent pelvic pain, accompanied by free hæmorrhage, lasting on and off for about seven weeks. Previously to this the menstrual flow, though somewhat scanty, had always been natural in colour, quantity, and periodicity. On June 30th last she sent for me, believing herself to be in labour and being very near the end of term. On vaginal examination no sign of opening in the cervical canal could be detected, and all that represented it was a very minute elevation about the size of a mustard seed, through which I found it impossible to get the smallest probe. As the pain she had then was evidently dyspeptic, I gave instructions to the nurse to be sure to let me know when true labour pains set in, as there would be need for surgical interference. On July 3rd at 5 A.M. she did so send, and I then found the head presenting and the os uteri somewhat stretched over it, carrying the elevation referred to high up in front of the head. After waiting three hours until the cervix had thinned considerably over the presenting part, the patient was deeply anæsthetised by Mr. E. J. Reynolds, and with a tenaculum I hooked down the cervix and, with antiseptic precautions, divided layer upon layer with a pair of blunt-pointed scissors, making the incisions in the transverse diameter of the pelvis, until the membranes were exposed. On account of some rigidity in the surrounding tissue I found it necessary subsequently to make two or three more incisions in other directions and then with considerable difficulty extracted a male living child, presenting in the third position, with long forceps, the child weighing nearly ten pounds. The patient two hours after delivery had severe post-partum hæmorrhage, becoming blanched, with rapid, feeble pulse, sighing respiration, and cold, sweating skin. Ergotine and ether injection subcutaneously, hot bottles to the feet, sinapism to the heart region, clearing out all clot from the uterus, and the hot uterine douche sufficed to remedy what was for some time an alarming complication. The cervix had twenty-five days after labour, though very irregularly notched, become otherwise normal, and the patient, with the exception of two days' high temperature—102° and 103° F.—due to irritable nipples, made an uninterruptedly good recovery. With a personal experience of over 4000 cases, only two with such a complication have come under my notice, the first being in 1878 in Queen Charlotte's Hospital, which was treated in a similar way by Dr. C. Grigg, the physician to in-patients. Though writing from memory, I believe there was a history in that case of previous intra-uterine medication; in my case there had been no such treatment.

CASE 2.—A woman thirty-two years of age, in her fourth pregnancy, sent for me on Nov. 23rd, the messenger stating that the child had been born before he left the house. On my arrival ten minutes afterwards I found the child (a large male), placenta, and membranes lying on the bed. The patient was in a most severe rigor, her teeth chattering, and the whole body violently shaking. After quickly removing the child and clearing away a good quantity of blood-clot, hot bottles were applied to the feet and back, an ounce and a half of brandy with hot water was given, and a hypodermic solution of ergotine administered as the uterus was flabby and large as felt through the abdominal wall. I quite hoped that the rigor might be a neurotic expression of shock, as the patient had been left alone in the house when the messenger started, but after thirty-five minutes, the rigor having quite passed off, I found her temperature raised to 104·2° F., the pulse being 136. She stated, in answer to my inquiry, that she had been quite free from pain until about one hour before the child was born, when she was seized with most intense pain in the sacral region, which continued with a feeling of downward pressure, unlike her previous labours entirely, until the birth of the child. She now still complained of the pain in the sacrum. Rectal examination next day failed to show anything in the bowel lining unnatural. The next day she was vomiting frequently bilious-looking, sour-smelling fluid; pulse rapid and small; face pinched in expression; profuse sweating; intense headache; swollen and tympanitic abdomen; lochia very scant. On the third day the lochia had entirely ceased. There was never any lacteal secretion, and the temperature was 104° in the evening and continued high, varying from 101·6° to 103·8° for the next six days. On the morning of Dec. 1st she became delirious, tried to get out of bed, rambled incoherently in her speech, and objected to being fed, dashing the cup away when the nurse attempted to feed her. Both urine and motion—the latter liquid, light-coloured, and most offensive in character—were voided unconsciously, and this condition lasted for many days. To this fact and the difficulty (though the patient was on a water bed) of keeping her thoroughly dry were chiefly attributable the bed sores which later formed over the sacrum and both ischial tuberosities. On Dec. 6th, at 4 P.M., there was a sudden fall of temperature to 97·8°, the patient being collapsed and her face and hands cold. Two hypodermic injections of ether, 30 minims, at intervals of half an hour, were given, and champagne by the mouth with 30 minims of liquid extract of opium. The evening temperature was 103·6°. She complained of much pain in the right forearm and right leg, both on the outer surfaces. These were tender to touch and were ordered to be wrapped in cotton-wool. Both limbs within the next twenty-four hours became swollen, red, and excessively painful, and on the fifth day fluctuation could be plainly made out; free incisions let out about three ounces of sanious-looking pus. A charcoal poultice was applied, followed by

dusting with iodoform and dressings of carbolised gauze. The left knee-joint became swollen and painful, measuring three inches more in circumference than its fellow. Extract of belladonna and glycerine and hot fomentations relieved this, and though it remained swollen for nearly a fortnight it did not undergo destructive change. The temperature after this fell somewhat, but was erratic, not becoming permanently normal until seven weeks after delivery. Her pulse also improved in volume and rate, but was always above 100 until about the same period had passed. The control of both bladder and rectum had become normal, and after a most protracted convalescence the patient entirely recovered. The bedsores were large and very slow in healing, the patient being exceedingly emaciated and the repair for a long time feeble. The uterus was washed out three times daily for the first week with hot water, to which tincture of iodine, one drachm and a half to the pint, was added. After this time, as there had never been any offensive lochia or shreds of membrane, this was discontinued and the ordinary vaginal douche used of a similar solution, followed by an iodoform and carbolic suppository after each injection. The patient is of feeble and strumous habit; she had lost two of her children from tuberculous meningitis, but had herself had ordinary good health until this illness, though she was much depressed by domestic and pecuniary worries. The medicinal treatment after the first few days consisted chiefly in the administration of large doses of quinine, and, in the convalescent stage, of mixed mineral acids, liquid extract of bark, and occasionally, as the patient rested badly, small doses of chloral and hyoscyamus. Apart from the general severity of the illness and its fortunate termination, the points of interest in this case seem to me to lie: first, as to what was the cause of the sepsis (the patient had not been exposed to any infectious illness, the house was in a perfectly sanitary condition, and as the rigor occurred without any digital examination having been made there was no possibility of infection having been communicated by either medical attendant or nurse); and, secondly, in the resolution of the mischief in the knee-joint, when inflammatory swelling starting in more favourable sites had previously run on to active change.

East Dulwich.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF GASTRIC ULCER UNACCOMPANIED BY HÆMATEMESIS.

BY J. M. WALKER, M.B., C.M. EDIN.

THE great majority of cases met with in the course of practice, in which pain in the epigastric region is complained of, are those of dyspepsia in its various forms, and in the absence of any positive evidence to the contrary it may generally be assumed that the pain is dependent on some functional disturbance, and is not connected with any organic lesion. That mere negative evidence is not always to be relied on, though, in forming a diagnosis, and that serious structural change may be going on in the stomach without anything pointing conclusively to such a condition, the history of the following case will prove.

A patient consulted me in the spring of last year about a pain in the stomach from which she had been suffering for some time and which latterly had increased in severity; there had been occasional vomiting of food, but no hæmatemesis, and in other respects she was fairly healthy. From the character of the pain, from the fact of its being limited to a narrow area, and from its persistency, I ventured the opinion that her case was one of something more than "indigestion" and that an ulcer of the stomach was probably the cause of her suffering. After many weeks of treatment with bismuth and lactopeptine, strict rules having been observed at the same time in regard to diet, relief from pain was obtained, digestion went on easily, and in due course my patient was able to discontinue medicine and to relax somewhat the rules that had been enforced in the matter of regimen. It was not until the winter that I saw her again, when I met her at the house of a relative whom I was attending, and I then learnt that in the interval she had had a most serious illness, but having gone to live in a different part of the town another practitioner had been called in. She was suddenly seized with a feeling which she described as that of impending dissolution, lost consciousness, and, I was told by one who was present at the time, a death-like pallor came over her. On the day following the bowels acted, when coagulated blood was passed to an extent that half-filled a chamber utensil, her seizure of the previous evening being thus accounted for and the chain of evidence as to the nature of the case completed, the hæmorrhage, taken in connexion with the other symptoms, leaving no room for doubt that it was one of gastric ulcer. Complete recovery followed a protracted convalescence, and the patient has since continued to enjoy her usual health.

Trousseau,[1] in treating the subject, remarks that "though gastrorrhagia is observed in the majority of cases of simple ulcer, it is a symptom which is sometimes wanting," and he quotes instances in which necropsies have unquestionably proved that such may be the case, a fact to be borne in mind when dealing with what might appear on the surface to be an aggravated case of dyspepsia only.

Edgbaston, Birmingham.

A CASE OF PARALYSIS FOLLOWING DIPHTHERIA OF THE GENITALS ONLY.

BY W. GAYTON, M.D., M.R.C.P. EDIN.,
MEDICAL SUPERINTENDENT OF THE NORTH-WESTERN FEVER HOSPITAL, HAVERSTOCK-HILL, N.W.

AN unusually well developed and nourished girl four years of age was admitted to the North-Western Fever Hospital on Oct. 28th, 1893. Her condition was as follows:—The skin of the groins, labia, and vulva was excoriated, owing to a very offensive, copious vaginal discharge. On separating the genitals the whole of the parts were found to be extremely swollen and covered with a membranous exudation of the true diphtheritic character, which had also crept along the vaginal cavity as far as could be seen. No urine, it was reported, had been passed for two days (?), and the bladder dulness extended a considerable distance above the pubes. As exquisite tenderness was present, preventing any attempt at instrumental interference, the patient was put under chloroform and a catheter passed. Some urine escaped while the patient was under the anæsthetic and a little was drawn off, showing a trace of albumen. The temperature was 96° F. only, the countenance very pallid, and the pulse feeble and slow. The vulvitis, it was stated, had existed for a fortnight, but the throat was not, nor had been, previously affected in the slightest degree by membrane. By the frequent application of a perchloride of mercury solution, combined with the administration of iron, and brandy, and a generous diet, steady improvement ensued, so that by the 19th of the following month the parts were nearly healed and the vaginal discharge had ceased; the albumen, however, continued, and the pulse and temperature kept subnormal. On the 23rd marked strabismus was observed, also palate paralysis, with regurgitation of fluids through the nostrils and an irritating noiseless cough. By the 26th the muscles of visual accommodation were impaired, the albumen persisting, slight vaginal discharge returned, but the genitals were quite free from membranous exudation and presented a perfectly healthy appearance. On the 30th the paralysis was more universal, the typical apathetic look and bearing being very pronounced. On Dec. 5th there was great difficulty in swallowing, the muscles of deglutition being now involved in the general paresis, with an almost constant impotent cough. Much headache was complained of, there was rapidity of pulse and more albumen, but less secretion of urine. Feeding by tube was resorted to, but death took place next day, due, apparently, to the direct toxic action of the diphtheritic poison on the bulbar centres, which is unfortunately so apt to occur with those children who become apathetic, have a nasal quality of voice, irregular sighing respiration, loose, almost noiseless, cough, with mucous accumulation and a rapid pulse. A good deal of diphtheria in all its forms is seen in the North-Western Fever Hospital, and the cases

[1] Clinical Medicine, vol. iv., p. 71

necessarily assume various types and select different localities for the exudative deposit. Examples of all kinds have come under view on different occasions, but of 2733 patients admitted during the past six years about six cases only have been genital. Its occurrence must, consequently, be by no means frequent. The chief point in view in recording the above case is to qualify a statement recently made—viz., that diphtheritic paralysis does not follow except when the fauces have been previously affected.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

LIVERPOOL INFIRMARY FOR CHILDREN.

MALFORMATION OF THE STOMACH AND INTESTINE; NECROPSY.

(Under the care of Mr. R. W. MURRAY.)

THE short account which follows is that of an unusual malformation of the intestinal tract, and chiefly possesses interest as a careful description of the state of parts as found at the post-mortem examination.

A female child a day old, with a harelip on the left side, was recently admitted into the Liverpool Infirmary for Children. The person who brought the child to the hospital said the bowels had been once opened, the motion consisting of a dark slimy substance. The first day the infant was in the hospital she took food greedily, but almost immediately vomited it. During the next two days the vomiting still continued, the abdomen became greatly distended, and the infant, gradually sinking, died when three days old. No meconium had been passed while the infant was in the hospital, though the rectum appeared to be normal.

Necropsy.—Lying towards the right side and occupying the greater part of the abdominal cavity was the cul-de-sac mentioned below. Between it and the rest of the distended intestine was seen the undeveloped ileum coiled up and resembling a nest of worms. The cæcum was displaced, being immediately underneath the umbilicus. The descending colon, sigmoid flexure, and rectum occupied their usual positions; all the other abdominal organs were normally situated and appeared to be well developed. There was no peritonitis.

The stomach and intestines were shown at the last meeting of the Liverpool Medical Institution, and the specimen was referred to a subcommittee to report upon it. The following is the report of the subcommittee:—

"The œsophagus and stomach appeared normal. The small intestine from the pylorus to a point thirty-six inches beyond was much distended, being an inch in diameter. The distension up to this point was fairly uniform, but the intestine then terminated in an enormous cul-de-sac, which measured six inches by four. Here the mesentery was much thickened and contained some enlarged glands. Attached towards the mesenteric border of this cul-de-sac was the continuation of the small intestine, which was about the thickness of a quill, firm and cord-like, not bile-stained, and possessing a fine lumen throughout. This undeveloped portion of the small intestine, which represented the whole of the ileum, measured thirty-four inches in length. The undeveloped ileum, though pervious right up to the cul-de-sac, was completely shut off from it by a thin septum, probably mucous membrane only, and no depression or fold within the sac indicated the attachment. The large intestine measured fourteen inches, was not bile-stained, and, together with the rectum, appeared normal. Cases of congenital occlusion of the small intestine, though rare, have been recorded by several writers, and the committee has no hesitation in agreeing that in this specimen an excessive coalescence has occurred at a point where the vitelline duct communicated with the gastro-intestinal tract. The total length of the small and large intestine is only about half what it should be, and the occlusion has occurred unusually high up (thirty-four inches from the ileo-cæcal valve), and was probably complete during the first few months of fœtal life, as the intestine beyond the occluded point contained no meconium."

PRINCE ALFRED HOSPITAL, SYDNEY, NEW SOUTH WALES.

FRACTURE OF THE SKULL; PARALYSIS ON THE SAME SIDE AS THE LESION.

(Under the care of Mr. G. E. TWYNAM.)

TRAUMATIC HEMIPLEGIA occurring on the same side as that of the injury is not usual, and when it does occur within a short time of the infliction of the injury may be put down to the existence of a *contrecoup* hæmorrhage. An interesting case was brought before the Clinical Society by Mr. Moullin,[1] in which right hemiplegia followed a blow on the right side of the head. The patient died on the ninth day. At the necropsy nothing was found to account for the paralysis. Mr. Hulke also mentioned the case of a man who was trephined over the seat of the lesion when suffering from traumatic hemiplegia; a quantity of serum was evacuated and the man recovered. Dr. Stewart[2] has published a case in which convulsions on the same side as the scalp wound followed the injury, and on trephining over the motor area of the opposite side a large quantity of blood escaped from beneath the bone and the man recovered. The line of treatment to be followed in these cases should be careful exploration of the region implicated in the injury, and afterwards trephining over the area on the opposite side, pressure on which would give rise to the hemiplegia.

A girl five years of age was admitted on Nov. 29th, 1893, to the Prince Alfred Hospital, Sydney, New South Wales, in a comatose condition, having been struck on the right side of the head by the knee of a runaway horse. When the child was first seen the pupils were equal and did not react to light, and the conjunctival reflex was lost. There was absolute paralysis of the right side of the face, of the right arm, and the right leg. The left side of the face twitched perpetually. Under irritation she would move the left arm and leg. The seat of the blow was directly above and partly behind the right ear, where there was considerable swelling.

An incision was made into the swelling, and when a quantity of effused blood had escaped a depressed fracture was exposed, the site of the fracture suggesting, both in size and shape, that half a tennis-ball had been driven into the skull. Two pieces of depressed bone were removed, of which the area of one was two inches by one inch, while the other formed an equilateral triangle, each side being one inch in length. The remaining depressed portions were forcibly raised, and their edges rounded off. Twelve fragments of broken-up bone were laid on the dura mater, which had not been torn, and the skin flaps were brought together, leaving an opening at the lowest point for drainage. The following notes of the case were made:—

Nov. 30th: The pupils are regular and react to light, and the face muscles have begun to recover, but she cannot speak. The right arm and leg remain paralysed, but she can use the left arm and leg. Consciousness is recovered, but not perfectly.—Dec. 1st: The paralysis of the right arm and leg has begun to pass off.—6th: The whole wound has healed except at the lowest point, and the place where the bone had been replaced seems to be hard and solid.—11th: Paralysis of the right arm and leg is still present to a considerable extent. The aphasia persists.—17th: Power of speech has returned quite suddenly this afternoon. Up to 1.30 P.M. she could not articulate, but by 2 P.M. she could say plainly whatever she wished. There is still a little suppuration from the lower angle of the wound.—By Christmas she could walk about the ward, but one small portion of bone which had been replaced had to be removed, after which she recovered perfectly.

The left side of the skull was carefully examined at the time for any superficial injury or fracture, but none was found. No fissure could be seen extending down from the fracture towards the base of the skull. From the situation of the fracture the arm and probably leg centres for the left side must have been considerably pressed on, although

[1] THE LANCET, Nov. 18th, 1893.
[2] Edinburgh Med. Jour., 1892.

the leg and arm of that side could be moved, when irritated, before the operation. The paralysis of the right arm and leg, together with the aphasia, point to the mischief being due more to *contrecoup* than to the severe surface injury on the right side, whilst the right facial paralysis, which passed off quickly after operation, was probably due to the original injury.

Medical Societies.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

The Influence of Different Kinds of Soil on the Comma and Typhoid Organisms.

AN ordinary meeting of this society was held on May 22nd, the President, Mr. HUTCHINSON, being in the chair.

A paper on the Influence of Different Kinds of Soil on the Comma and Typhoid Organisms, by Dr. R. DEMPSTER, Cobb Research Scholar, was communicated by Dr. MITCHELL BRUCE. The work was carried out in Professor Macfadyen's laboratory at the British Institute of Preventive Medicine. This research was undertaken with a view to answering the following question: Had the soil in itself any action favourable or injurious to the life of the comma bacillus of cholera Asiatica and the bacillus of typhoid fever, or did the length of life of these organisms in soil simply depend upon the amount of moisture that might be present? The action of the saprophytic bacteria present in the soil was left out of consideration altogether. For the purposes of this research sterilised soils alone were used. The experiments were carried out with white crystal sand, yellow sand, garden earth, and peat. These soils were sterilised by means of moist heat. It was found that small quantities of the soils were rendered sterile when steamed for one hour on each of three successive days. The first series of experiments was carried out with the comma bacillus of cholera Asiatica, an organism most sensitive to external influences. Fresh agar cultures of the comma bacilli were used, and from these emulsions of the bacteria were made in 0·75 per cent. salt solution or in distilled water. Measured quantities of the emulsions (not exceeding 1 c.c.) were added to the various soils. The tubes with a few exceptions were kept at room temperature, or at 22° C. Cultures were made from the tubes at intervals in order to determine the presence or absence of living bacteria. Experiments were made with a dry soil without anything being done to prevent loss of moisture. The results were as follows: in white crystals and—comma bacilli alive on third but dead on fourth day; in yellow sand—comma bacilli alive on third but dead on fourth day; in garden earth—comma bacilli alive on third but dead on fourth day. The comma bacilli must have died, therefore, between the third and fourth day. Experiments were next made with a moist soil, which, however, contained no excess of moisture. In this case also nothing was done to prevent loss of water by evaporation. The results obtained were the following: moist white crystal sand—comma bacilli alive on the seventh day; moist yellow sand—comma bacilli alive on the thirty-third day; moist garden earth—comma bacilli alive on the thirty-third day. Experiments were made to find the length of time comma bacilli would live in a soil when any excess of moisture was allowed to pass through the soil, but where little or no loss of moisture took place from the surface of the soil. Under such conditions it was found that the bacilli were alive in white crystal sand on the twenty-eighth day, in yellow sand on the sixty-eighth day, and in garden earth on the sixty-eighth day. Experiments were made with a soil which had been deprived of its moisture. In this case it was found that the comma bacilli did not live longer than one to two days. Experiments were also made to find the relative length of life of comma bacilli on soils in which moisture was allowed to escape and on soils in which evaporation of moisture was prevented. The experiments that were made with white silver sand showed that when moisture was allowed to escape the bacilli were alive on the third day, but were dead on the eighth day; on the other hand, when the evaporation of water was prevented the comma bacilli were still alive on the forty-seventh day. Experiments were likewise made to find the rate at which the soils lost their natural moisture by evaporation. The amount of water in each of the soils used varied greatly. From the above experiments it might be expected that, on the soil containing the least moisture, or on that which could part with its moisture in the shortest time (by drainage or evaporation), the life of the organisms would be shortest. Parallel experiments were made with soils containing a relatively small amount of moisture. It was found that garden earth became dry in seven days, yellow sand in four days, and white crystal sand in a few hours. These results, however, were due to the varying amounts of moisture present in the soils experimented with, garden earth containing more moisture than the sand. Under equal conditions of temperature the rate of evaporation was about the same in the three soils, but in nature, owing to local and seasonal conditions, the rate of loss would not be the same; thus good drainage would carry off the moisture more quickly, and one soil would drain more quickly and thoroughly than another. Further experiments were made to find the relation between the amount of moisture in the soil and the length of life of the comma bacilli. To quote an illustrative experiment. In white crystal sand, where evaporation was allowed to take place, the bacilli were still alive on the twenty-seventh day, with 1·57 per cent. of moisture in the sand. The bacilli were dead on the thirtieth day, with 0·66 per cent. of moisture in the sand. When evaporation was prevented the bacilli were alive on the 174th day, and the sand still contained 7·1 per cent. of moisture. This experiment illustrated the close relation existing between the amount of moisture in the soil and the length of life of the organisms. With regard to peat, it was found that the comma bacilli were invariably dead in twenty-four to twenty-six hours, independently of the amount of moisture that might be present. In sterilised 0·75 per cent. salt solution the bacilli were still alive on the 174th day. In sterilised urine the bacilli lived at blood heat for fourteen days and at 22° C. for twenty-nine days. In experiments with the bacillus of typhoid fever on a dry soil where evaporation was allowed to take place the following results were obtained: in white crystal sand the bacilli were found up to the ninth day, in yellow sand up to the eighteenth day, and in garden earth up to the fourteenth day. On the moist soils, on the other hand, the following were the results: in moist white crystal sand the typhoid bacilli were alive on the twenty-third day, in yellow sand and on garden earth on the forty-second day. On soils which had been deprived of their moisture the bacilli were only found up to the seventh day. Experiments made with peat showed that on this soil the bacilli did not survive longer than twenty-four hours. Similar results were obtained with the comma bacilli. Peat was the only one of the four soils used which exercised a distinct destructive action on the organisms, independently of the amount of moisture present. Experiments were finally made to test the filtering capacity of the soils. With a filter six inches thick the results were as follows: white crystal sand held back 99·6 per cent. comma bacilli; yellow sand held back 99·9 per cent. comma bacilli; garden earth held back 89 per cent. comma bacilli; and peat held back 100 per cent. comma bacilli. On the other hand, a current of water could carry the comma organisms through two feet and a half of porous soil. *Conclusions:* White crystal sand, yellow sand, and garden earth had no marked favourable or injurious action on the life of the organisms. The length of life of the organisms in the soil depended chiefly on the amount of moisture present. Peat, on the contrary, was very deadly to both the comma bacillus and the typhoid bacillus. The soil acted as a good filter, holding back most of the organisms, but it was possible for these organisms to be carried through two feet and a half of porous soil by a current of water.

The PRESIDENT said that few were probably aware of the amount of labour involved in such a research, which had a most important bearing in reference to the filtration of waters for the public supply.

Brigade-Surgeon SCRIVEN said that one outcome of the research was to demonstrate that one soil at least was hostile to the life of the comma bacillus. He said that in India they recognised certain places as being out of the cholera area, such as Multan in the Punjaub, while the neighbouring district of Lahore was often decimated. It would be most useful to regiments moving to escape cholera to know of a soil deadly to the bacillus. Cholera did not last long upon a dry soil, but it was always present in damp Bengal, where cases often broke out apparently sporadically.

The tendency of the research was to bring us nearer to acknowledging the possibility of the *de novo* production of disease, for if the bacillus could live for 174 days in soil it would be impossible to prove its previous existence in another person. Murchison certainly held this view with regard to typhoid fever. While the presence of a moderate amount of wet was favourable to the development of cholera a heavy rain was inimical, for it washed the bacilli down into the soil

Dr. WASHBOURN thought that Dr. Dempster was justified in drawing the conclusions he had done from his experiments, which confirmed in the main the work of previous workers. As to cholera, the investigations of Koch and Kitasato had shown the effects of moisture and drying on the vitality of the bacillus. Broth cultivations were dried on cover-glasses, and in three hours all the bacilli were destroyed. Kitasato made similar experiments with gelatine cultivations, which retained their vitality for a somewhat longer period. The same observers found that the bacilli remained active in a moist medium for seven months. Uffelman found that the cholera bacilli died in from one to three days in dried earth, while others had demonstrated that they would continue to multiply if added to moist soil. No multiplication of the comma bacillus occurred in some kinds of non-sterilised earth. Cultures of comma bacillus added to fæces kept alive for two or three days. The results obtained with the typhoid bacillus were different. Pfuhl showed that if they were dried on a cover-glass they would live as long as eight or ten weeks, while Sternberg had shown that if they were kept moist they would live for eighteen months. Uffelman demonstrated that with dried garden earth the typhoid bacillus would remain alive for from ten to twenty-one days, and with white sand for seventy days. With moist soils Grancher and Deschamps found that they lived for three and a half months, and Karlinski, under the same conditions, found them alive for three months. The latter observer added pure cultures of typhoid bacilli to unsterilised earth and found that the bacilli died rapidly, due to the action of saprophytic organisms; if added to putrifying fæces they retained their vitality for several months The experiments on peat were very important. He asked what was the reaction of peat and what salts it contained, and also if it contained a number of saprophytic bacteria.

Mr. WARD-HUMPHREYS said that the water-supply of Cheltenham had hitherto come from the hills, but it was now proposed to bring in a further supply from the Severn. The Worcester sewage went into the river just above the proposed intake, but the well-known presence of peat in the Severn water might, in solution, act injuriously on any bacilli that might be present. He inquired if this surmise was confirmed by experimental observation.

Dr. KENNETH MACLEOD referred to the researches of Dr. Douglas Cunningham on typhoid bacilli in milk. As long as the milk was left unsterilised the typhoid bacillus was quickly stamped out by the other organisms present, but in sterilised milk the added typhoid bacilli developed very favourably. There were a number of other factors governing the development of bacilli: the presence of filth was perhaps of even more importance than that of moisture. He himself could not admit it to be absolutely demonstrated that the bacillus was the *causa causans* of cholera, though that view served as a good working hypothesis. Temperature was also important and had a good deal to do with the development of cholera. There were degrees of moisture unfavourable to its development; too much moisture stopped it. Great excess and great diminution of heat were also unfavourable.

Dr. CAYLEY said that typhoid fever was at present extremely prevalent amongst the English troops in India, and it prevailed under circumstances which were not connected with the contamination of water or of milk. It appeared indeed to be spread by dust. As Uffelman had shown that the bacillus of typhoid fever could live for ten weeks in dry earth and for forty days on dry wool, it was quite possible for bacilli in dust to be alive and active. If this were true it demonstrated the fallacy, in a dry country like India, of further developing the dry earth latrine system, for the earth impregnated with typhoid stools and spread upon the land might be one cause of the recent extension of typhoid fever in India.

Mr. SHIRLEY MURPHY said that the favourable action of moisture in the development of typhoid bacilli might help to account for its constant prevalence in certain districts in the East of London.

Dr. ALLAN MACFADYEN, who spoke in reply, in the absence through illness of Dr. Dempster, said that the writer was aware at the time that he started his investigations that the path he was taking was not a novel one, but the importance of the subject led him to pursue it. He himself was of opinion that the truth lay between the view of Pettenkofer and that of Koch. Experiments conducted upon the surface soil were most important because the surface soil was most likely to be contaminated by pathogenic organisms from man, &c., and, acting as it did as an efficient filter, it retained a large number of such organisms in its upper layers. The deeper layers of the surface soil did not possess a suitable temperature for the continued life of pathogenic bacteria, and, again, the influence of saprophytic bacteria was only exerted in the uppermost layers of the soil. For practical purposes the surface soil could be regarded as consisting of three layers: (1) the extreme superficial layer, which was usually either very dry or very moist; (2) an intermediate layer, which was always damp, and which did not admit of evaporation; and (3) a deeper layer, lying immediately above the subsoil, which was kept wet by capillarity from the subsoil. The three factors to be considered in studying the questions raised in the paper were the soil, the water, and the action of other bacteria The paper itself dealt with the first two of these, and with regard to the third a later communication would be made; but they had ascertained already that cholera organisms would live in soil a long time side by side with saprophytic organisms. Dr. Dempster's experiments differed a little from Uffelman's, but these differences might depend upon the number of bacteria used and the varying resisting power of the different samples of micro-organisms. Peat contained a large number of spores of bacteria, and a point for their future investigation would be to compare the number of bacteria present in peat with those in other soils. The peat was acid in reaction, and some complex soil acids were present. At present no direct experiments had been made with peat in solution. They were now engaged in working out the effect of the presence of filth on the growth of the micro-organisms. There was evidence to show that temperature also played an important part. The presence of summer heat and of a salt solution lengthened the life of a comma bacillus. In conclusion Dr. Macfadyen bore testimony to the patience with which Dr. Dempster had conducted these experiments, and he wished also to express his gratitude to Mr. Cobb, the founder of the scholarship, who had so generously defrayed the expenses of this important research.

HUNTERIAN SOCIETY.

Adjourned Discussion on Diphtheria.[1]

THE adjourned discussion on Diphtheria was held on May 5th, Mr. C. J. SYMONDS in the chair.—Mr. ST. CLAIR B. SHADWELL said that he was medical officer of health of one of the eastern suburbs divided from London by the river Lea. The annual number of deaths from diphtheria had been few, and in 1870 and 1872 there had been no such deaths at all. Between 1873 and 1879 the number amounted to about three annually. From 1880 to 1886 (1880 being a memorable year in the history of the district, inasmuch as it was then that the present system of drainage was entered upon) the annual number of deaths averaged ten. In 1887 there was a sudden rise, equal to a death-rate of 1·5 per 1000, and in 1888 of 1·7. Since that date the rate had gone down, and for some years it had been 0·6 per 1000.—The Medical Officer of Health of Plumstead held very strongly that the great cause of the spread was the ventilation of the sewers into the road. The speaker thought it was quite possible that water might sometimes serve as the vehicle and referred to the case of a lad employed at a dairy, who contracted diphtheria and was placed in a room the floor of which had wide crevices, and beneath it was the water cistern. It was impossible to prove that the water was really contaminated, but the fact remained that seven other persons in that house caught the disease. The only domestic animal that appeared to him to have any share in disseminating the disease was the cat, and a few instances of this had come to his notice. Skilled opinion at present tended to regard bad smells as not having much to do with the causation of the disease. He then showed on the screen a rough plan of the district, pointing out how the disease had

[1] Continued from p. 1140.

occurred in a particular street, and it looked really as if the system of drainage had something to do with its spread. In other parts of the district it had spread in the neighbourhood of certain schools, having been conveyed thither by one of the patients from the infected street. If anything was to be done to check the spread of the disease there must be a definite understanding between the school and the sanitary authorities. Diphtheria might be conveyed a considerable distance, and he instanced a case in which it could be clearly traced from New York to Liverpool and further into the country.—Dr. WASHBOURN had never had the slightest difficulty in demonstrating the presence of the bacillus, and this in large numbers, in all recognised cases of diphtheria. The bacillus was only found in the membrane; it was therefore a local disease, for the bacillus never grew in the tissues or fluids of the body. The membrane which formed on the fauces was very different in appearance from that which formed in the trachea, and as it spread into the smaller bronchi it gradually changed into a thick exudation.—Dr. SIDNEY MARTIN had been able to separate certain albumoses and organic acids which, when injected into rabbits, produced death, preceded by paralyses such as were met with in the human subject after diphtheria.—Dr. WASHBOURN then described the method of making cultivations of the bacillus from the membrane. This was a very simple matter. A patch of membrane was washed with sterilised water, and then a piece was "hooked off" with a sterilised platinum wire and sown on the surface of some blood serum. The tube was put in an incubator, and within twelve hours a diagnosis could almost certainly be made. If the case were one of diphtheria there developed on the surface of the serum a number of large white colonies of the diphtheria bacillus; when a little of the culture was spread on a cover-glass, dried, and stained with methyl blue the bacillus could be seen with a high power. It consisted of rods, clubbed at the ends, and taking the stain irregularly. It had been assumed that the "pseudo-diphtheria bacillus" was only a modification of the ordinary diphtheria bacillus. In favour of this view was the fact that the ordinary virulent bacillus could be rendered non-virulent by certain methods of cultivation. In 45 children suffering from various diseases of the throat other than diphtheria the pseudo-bacillus had been identified in 15, and the examination of the fauces of 49 healthy children showed it to be present in 26. It had been suggested that the non-virulent bacillus might undergo an increase of virulence in the presence of a certain inflammation, and this view would explain the occurrence of many outbreaks of the disease. Membranous exudations often occurred in scarlet fever, but this was not diphtheria, for the bacillus could not be found; and clinically this exudation differed also, and was not followed by paralyses. Another class of cases were those of real diphtheria without membrane. He referred to the case of three brothers in the same house, all of whom were attacked with sore-throat. The first two had simple redness of the fauces, but showed the diphtheria bacillus, and the third shortly afterwards had a typical attack of membranous diphtheria. As to the duration of infection, fourteen days after the disappearance of the membrane virulent bacilli had been found on the tonsils. One might get a membranous exudation in the throat of pigeons, which, though contagious, was not diphtheria.—Dr. HINGSTON FOX showed diagrams to illustrate the mortality from diphtheria during the past thirty-five years in London, as recorded by the Registrar-General. Starting with a death-rate of 284 per 1,000 000 in 1859 and subsequent years, a long period of quiescence followed between 1864 and 1882 (only 80 per 1,000,000 in 1872), since which there had been a rise, considerable in 1888 and 1889, and still more in 1892 and 1893, until last year the mortality reached 750 per 1,000,000 inhabitants. If diphtheria had an epidemic cycle it must be one of long period. The mortality from scarlet fever was altogether on a larger scale, attaining in epidemic years (as in 1870) even 1875 deaths per 1,000,000. It bore no relation to the diphtheria death-rate and had been low in recent years. Measles also bore no such relation; this disease showed a curious tendency to be prevalent in alternate years. Enteric fever was the only specific disease bearing an apparent relation to diphtheria, and this was one of inverse prevalence; during the present epidemic the enteric fever curve had been depressed. The inverse relationship, in geographical occurrence, of these two diseases had been clearly shown. A second diagram displayed the seasonal prevalence of diphtheria, which was like scarlet fever, increasing in the autumn and declining in January, only to a less marked extent. On the third chart the distribution of fatal cases over different ages and sexes was marked out, showing, of course, the selection mainly of the early years of life and the slightly greater liability of females to be fatally affected. The gradual change in the disease, leading it to become more prevalent in towns and less exclusively in the country, its great variability and association with apparently simple tonsillitis, and its having no constant skin rash, suggested that it was yet unstable and had not developed to the stable position of other specific fevers.—Dr. GLOVER LYON said that at one of the fever hospitals all cases of sore-throat among the nurses or staff had been treated early by local applications during thirty-five years without one death. The mere number of deaths, to the extent of double that in former epidemics, did not prove that we were in a very much worse state, because the improved diagnosis must be taken into account. With regard to typhoid fever it did not seem probable that there was any connexion between the two. The extra exactness of diagnosis in typhoid fever and the care in its treatment had reduced its mortality.—Dr. F. J. SMITH referred to three cases. He treated each with a different local application and all had recovered.—Mr. THORP had long used a combination of phenol, turpentine, and strong liquor ferri perchloridi, locally.—Dr. WALTER CARR asked whether a membrane in the throat proved not to be diphtheritic could be pronounced not infectious, and therefore in no need of isolation.—Dr. J. H. SEQUEIRA said he had had experience at a fever hospital of 300 or 400 cases. The mortality with or without treatment was between 30 and 35 per cent. The use of local treatment or not did not seem to make any difference.—Dr. ARTHUR DAVIES observed that the empirical method of treatment by attacking the membranes had a solid scientific basis, the bacillus being in the superficial part of the membrane.—Dr. NEWTON PITT, in reply, referred to the energetic steps taken in New York, where a medical official examined free of charge membrane from any patient, sending two sterilised tubes to receive the specimen; within twelve or fifteen hours a message was sent to the medical man whether or not it was a case of diphtheria. In two out of three cases of membrane no bacillus was found. In Paris, if the bacillus were not found the children were sent back to their homes.—Dr. GOODALL said that if the larynx was implicated the case was one of diphtheria. It was good treatment to get rid of the membranes as fast as they could, applying the spray, or, better, washing out the mouth with a Higginson's syringe. He had never sent a child out under six weeks, and much longer after a bad attack. He had never had a case sent back from the same house, though this was tolerably frequent in scarlet fever. Adults might go out at the end of a month, but should be warned against kissing their children.—Dr. WASHBOURN said the bacillus was present, not only in the membrane, but also in the adjacent parts, and this would explain how it was that the membrane returned after removal.

PROVINCIAL MEDICAL SOCIETIES.

CAMBRIDGE MEDICAL SOCIETY.—A meeting of this society was held on Friday, May 4th, Mr. HYDE HILLS, President, being in the chair. The minutes of the preceding meeting were read and confirmed. There were twenty members present and two visitors. The following communications were made. Sir GEORGE HUMPHRY contributed a communication on Chronic Ulcers of the Leg, which was read by the Hon. Secretary.—Mr. WHERRY read the notes of a case of Inverted Uterus of twelve months' duration, reduced under an anæsthetic by manipulation, in a patient aged thirty-three under his care in the hospital. The patient had been married three years and a half. The first child, a boy, was born ten months after marriage (in October, 1891). Instruments were used, a ruptured perineum was sewn up, and the patient made a good recovery, having no subsequent hæmorrhage. The second child, a girl, was born in May, 1893. The practitioner not arriving in time, the patient was attended by a neighbour, who, according to the account given by the patient, pulled away the after-birth, and the womb came down with it and there was serious hæmorrhage. The practitioner came about a quarter of an hour after the commencement of the bleeding and gave a hypodermic injection, which checked the hæmorrhage. The patient lost a good deal of blood for some days, and on her getting out of bed on the tenth day the womb came down and

was replaced by the nurse, and she then remained quiet in bed some days longer. The bleeding continued for about a month and was followed by a whitish discharge, which lasted up to the time of admission. The patient took various medicines, but was not examined per vaginam. Six months ago the hæmorrhage began again, the patient being under the impression that she was recommencing menstruation, but it has continued on and off since that time, varying much in quantity. The patient had felt very weak since her last confinement, only doing the lightest housework; she had not had severe pain, but some persistent headache and at times bearing-down pains. About a fortnight before admission (Sunday, April 8th) the patient had a severe attack of hæmorrhage, but did not call in a medical man. Bleeding continued slightly during the week, and on Sunday, April 15th, while straining at stool, she had another attack and lost a great deal of blood. The medical man gave a hypodermic injection with good results. On Tuesday, April 18th, a vaginal examination was made, inversion of the uterus was discovered, and the patient was admitted into hospital next day. Nearly a year after her last confinement with the history above given she was put fully under an anæsthetic, and by patient use of the bi-manual method the uterus was put into perfect position, the operation taking about twenty minutes. The diagnosis until the anæsthetic was given was by no means certain, the resemblance to a polypus being very close. The last case Mr. Wherry had to reduce was only two days after labour and is recorded in the proceedings of this society, October, 1882. The use of Aveling's repositor was then considered, and a discussion followed on the subject. The inversion when seen soon after labour, though possibly more easily reduced, involves the large and soft uterus, so easily torn by the most careful hands, and a rubber appliance was used to assist the fingers. Aveling's repositor is usually successful in more chronic cases.—Mr. WHERRY also brought forward a case of Cervical and Substernal Goitre and showed the patient, a fat and flabby youth of fifteen years of age, who weighed fourteen stone and who had had repeated attacks of so-called "asthma." On Christmas Day last he had a severe attack of dyspnœa which ended in complete unconsciousness. Dr. Greer consulted Dr. Latham, who advised a speedy tracheotomy. He arrived at the patient's house to perform this operation in company with Dr. Greer, but found the small, dark house quite unsuitable for operation on a goitrous swelling which extended below the sternal notch. The patient was profoundly insensible, with a dusky and death-like aspect, breathing at long intervals—a sucking, wheezy breath. They conveyed him in this state to the hospital. At once a complete exposure of the trachea was made; but the whole of the middle lobe and part of each ala of the thyroid had to be removed, leaving the flattened windpipe exposed at the bottom of a deep wound. (The portions removed were here exhibited.) This was done without any anæsthetic, and the patient was recovering nicely, but next day developed some tracheitis, and the trachea was opened in the middle line and a large Durham's tube was inserted. The trachea was flattened laterally. The patient's condition for a long time was very precarious from attacks of bronchial and tracheal distress of breathing and accumulation of mucus. Mr. Tebbs devoted himself to the case, and with careful nursing, in spite of many relapses, the patient recovered, but his mind was often wandering, and he wetted his bed, became generally babyish, and had to be managed like a child. His friends assured him (Mr. Wherry) that that condition occurred sometimes before the operation. He was ordered tabloids of extract of thyroid gland and took them three times a day for two months, with great benefit. He was now not noticeably fat; in fact, he had lost 4 st. in weight and seemed rational in his mind. His nocturnal snoring from narrowing of the air passage, which was a great disturbance to the patients when the tube was first left out, was not now troublesome. The wound had healed, and the enlarged thyroid alæ were very much smaller. It seemed probable in this case that there was an antecedent condition of myxœdema from disease of the thyroid gland. Total removal of the thyroid had been followed by myxœdema, but this was not so in partial operations. The patient was rescued from death by a formidable operation, but his case required also a long course of after-treatment.—Dr. GREER and the PRESIDENT made some remarks upon the case.—Dr. J. GRIFFITHS exhibited a case of Unusual Malformation in a Fœtus aged six months, in which the eyes were fused into one central mass; the middle and inferior maxilla were absent, the ears being almost joined together in front at their lower parts. The skull was almost globular. Both feet were in a state of talipes equino-varus, and in the right upper limb the radius and thumb were absent, the hand being in the position as was usual in such cases of extreme radial flexion. The mother had borne other children, who were alive and well and who did not present any deformity. This specimen was sent to Dr. Griffiths by Dr. Fordyce for presentation to the Cambridge Pathological Museum.—Mr. COX showed a case of so-called Superfœtation and read a few notes relating to it. It was decided to defer the question of superfœtation to a discussion at the next meeting.—Mr. C. LUCAS showed a specimen of Anencephalous Fœtus.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on Wednesday, May 16th, Dr. CLOUSTON, President, in the chair.—It was devoted to a discussion on Massage, which was opened by Dr. HALLIDAY CROOM, who read a paper on Massage as an Adjuvant to Medical, Surgical, and Gynæcological Practice. He referred to the different systems of massage, which, he said, included simple massage, the Weir-Mitchell treatment, and the Swedish system of medical gymnastics. Speaking of his own experience, he said he had seen several cases of severe constipation in women in which massage of the abdomen had effected a cure when drugs had failed. In cases of gall-stones he had seen much benefit from massage of the gall-bladder. Gall-stones might be got rid of by this means, though its use was not without risk. In cases of neurasthenia he had had many successful results with the Weir-Mitchell treatment. In gynæcology he could record very little success with massage. The use of internal massage of the pelvis, which had been recommended lately in France, he condemned in the strongest terms.—Mr. A. J. KEILLER spoke of the physiological effects of massage, which, he said, might be classified under circulatory, nervous, and moral. He gave an account of a number of cases which he had treated successfully. Among these was one of varicose veins of the legs, which had been practically cured by the addition of massage to treatment by support.—Dr. J. H. A. LAING advocated the use of abdominal massage in constipation, but thought it should be combined with exercises specially directed to strengthening the abdominal muscles. In cases of neurasthenia the Weir-Mitchell treatment was followed too closely, and many of its restrictions might often with advantage be relaxed. When medical gymnastics were employed it was of the utmost importance that they should be given short of fatigue. Massage was not sufficiently used in cases of sprain. It should be begun on the day after the accident and should be applied always above the joint until some of the effusion had gone. By the second or third day passive movements should be made in all the correct directions, except that in which the part had been strained. In average cases the patient should be able to walk with a bandage at the end of a week.—Dr. W. ALLAN JAMIESON spoke of massage in the treatment of diseases of the skin. In the early stage of alopecia prematura he recommended kneading of the scalp backwards and forwards several times a day as an adjuvant to medicinal means of treatment. In that form of diffuse symmetrical scleroderma in which there was induration and not atrophy he had also found great benefit from massage.—Dr. JOSEPH BELL thought that bad sprains should not be treated by massage at first; for mild sprains, however, he advocated early massage and early movement. He even went further and treated every case of Colles' fracture in which he had an opportunity without splints and with massage. There was a form of joint-disease, accompanied by effusion, which was occasionally seen in delicate young men or women, usually in the knee or hip, which looked like white swelling, but was not. The condition was really due to weakness of those muscles, the tendons of which crossed the joint. Treatment by blistering and rest did no good in these cases, but they were wonderfully improved by massage of the muscles of the leg and thigh. He believed that for the successful treatment of cases of neurasthenia by the Weir-Mitchell system the one essential was to get a really good nurse. Success depended more upon the personal equation of the nurse than upon anything else.—Professor CHIENE, speaking of massage with special reference to the motor system, said it was of value, firstly, as a means of relieving pain. For this purpose it required to be gentle, and upon the nerve terminations. Secondly, it was of value for the prevention of adhesions, in which case it required to be of a firmer character.

Thirdly, it was of importance as a means of breaking down adhesions. He frequently saw cases in which adhesions in sprained joints had been allowed to remain until they had become firm. It was necessary to break them down. This could be done in two ways. The first way was, after having discovered the seat of a small adhesion, which was generally indicated by a painful joint, to relax the part so as to get a run, as it were, and then suddenly to forcibly stretch the adhesion. The second way in which one could break down such adhesions was by a kind of massage, which consisted in a firm rotatory movement with the thumb, by which means it was possible to act on the deeper structures through the skin. He thought that the earlier they began rubbing sprains the better. It might be done even on the first day. He was coming round to the belief that massage was beneficial for early tuberculous disease of joints.—Dr. YOUNG gave an account of some cases treated by the Weir-Mitchell system, and commented on some of its details. He was convinced that there were many cases in which the system was a most powerful means of treatment, and, indeed, the only one that would do any good.—Mr. C. W. CATHCART said that he had studied the effects of massage upon recently amputated limbs. He had observed that the remaining blood was quickly emptied, and in one instance in which the muscles were still active, fibrillar movements were produced in them. This seemed to show that massage, in addition to increasing the circulation through a muscle, probably acted upon it in a similar way to electricity, stimulating the fibres. Probably massage also stimulated glandular organs. He believed in complete rest for tuberculous joints, and thought that it would be a risk to apply massage to them.—Mr. H. J. STILES said that when recently in Berne he had his attention specially directed to the treatment of early tuberculous disease of joints with massage by Professor Nichans, who assured him that he had found it very beneficial, especially in the case of those joints of which the synovial membrane could be most thoroughly got at.—Dr. AFFLECK directed attention to the value of massage in the treatment of alcoholic paralysis.—The PRESIDENT said he had tried the Weir-Mitchell treatment in a number of cases of melancholia. His experience had on the whole been unfavourable, though he had had some remarkable successes. In some cases in which there was trophic deficiency massage was undoubtedly valuable.—Dr. SOMERVILLE (Glasgow), Dr. JAMES RITCHIE, Dr. JAMES CARMICHAEL, Dr. GEORGE HUNTER, and Dr. JOHN PLAYFAIR also took part in the discussion.—Dr. CROOM replied.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on May 16th, Dr. W. HUNTER, President, being in the chair.—Dr. BOOBBYER gave a short account of the Past History of Small-pox, together with that of Inoculation and Vaccination. After comparing the deaths and death-rates from small-pox in years prior and subsequent to the further extension of vaccination from time to time, he drew attention to the fact that in 1889 and 1890 the disease had so nearly disappeared from this country that only 23 and 16 deaths in the two years respectively were recorded throughout its whole extent. He gave some account of local outbreaks, from which the general epidemics of 1893 and 1894 had arisen, and pointed out that the disease frequently, as indeed might be expected, showed a tendency to run for considerable periods through single social strata. He gave instances of this, stating that a large part of the 1893 epidemic in Nottingham was confined to tramps and workhouse inmates, whereas that of 1894 had been almost exclusively restricted to persons employed in factories and warehouses. He next discussed the symptoms of the several varieties of small-pox in detail, and showed photographs illustrating each variety in its several stages. Referring to prodromal rashes, he said that they were now known to be more common than they were once thought to be; they occurred more frequently in modified than in unmodified small-pox. In one batch of 37 cases of the disease occurring in the Nottingham Lace Market, which he had an opportunity of studying from their onsets, he had recorded no less than 14 instances of the occurrence of this rash. All the 14 were vaccinated, all were females, and all but 3 were under thirty years of age. He described one case, not in this group, in which the prodromal rash occurred, where the latter was distinctly hæmorrhagic, and especially dark in the axillæ and groins, but without extravasations into the eyes or internal organs, and which made a good recovery without a bad symptom after an extremely modified subsequent small-pox rash. This variety of prodromal rash was referred to in books, but was not often seen. In describing the normal development of the small-pox rash he stated that its appearance and development on the lower extremities were almost always later—often twenty-four hours later—than on the face and upper parts of the trunk. He gave the history of two cases in which the patients appeared to have inoculated themselves through handling infected stuffs. In discussing the differential diagnosis of small-pox, and especially modified small-pox, from chicken-pox and other diseases he said he had noticed one sign which he could not find recorded in any books on the subject: he alluded to the polished, circular, often rayed scab seen on the upper extremities especially, but also elsewhere, in almost all small-pox cases. These scabs, he said, were always more or less developed in mild and modified cases—in all those cases, indeed, which were otherwise difficult of diagnosis. They appeared to originate in and around the retaining bands uniting the epidermal covering with the skin beneath. With the aid of a magnifying glass they could be seen commencing to form at a very early stage in those vesicles and pocks which underwent a partial absorption. He next described an epidemic confined to the inmates of one warehouse room in which were made up some cotton goods sent in by a married couple suffering from the disease in its acute stages. From his observations here and elsewhere, he said, he was inclined to think that the later stages of small-pox were less infectious than they were commonly thought to be. In speaking of air-borne small-pox he insisted upon the necessity of recent vaccination for all persons whose duties brought them at all near to small-pox hospitals or their immediate enclosures, and he gave four instances of infection apparently conveyed through the air, in two of which men employed by large firms working for the Nottingham and Oldbury Corporations had been the victims.—The PRESIDENT and Drs. WATSON and MUTCH, and Messrs. WILLS and COX discussed the paper.

Reviews and Notices of Books.

The Student's Handbook of Medicine and Therapeutics. By ALEXANDER WHEELER, L.R.C.P. Edin. Edinburgh: E. and S. Livingstone. 1894.

IN spite of the abundance of literature provided for the modern medical student, it is not as a rule easy to find a concisely written book which shall be used as an adjuvant to the study of extended treatises. Many of the compendia which have been issued with this object are little more than clever catalogues of the signs of morbid states, which could be far more profitably compiled by the student himself. The small, but at the same time complete, handbook which Mr. Wheeler here offers is of a higher grade. It does not pretend to cover the whole ground of medicine in descriptive detail and argument, but it is distinctly designed to refresh the memory on salient points, as well as to enunciate the leading principles of treatment. These aims appear to us to have been faithfully carried out, and that too with an originality for which it might have been thought there could be little scope. There can be no doubt that the possession of such a book—and its appropriate use—would be of service to the student, and, for the matter of that, to the practitioner also. The descriptions are clear, concise, and accurate, but they will be best appreciated by one who has already made good use of his time in reading and clinical work, and who desires to refresh his memory on the main points in disease. The book is so excellent of its kind that we fear it may be taken by some of the less zealous as sufficient for all the "book-knowledge" required by examiners. It would be unfair to the author, and a mistake on the part of the student, to relegate it to such a purpose.

The Year-book of Treatment for 1894: A Critical Review for Practitioners of Medicine and Surgery. London: Cassell and Co., Limited.

IN the ten years that have elapsed since this annual publication was commenced there have been change and progress

in therapeutics as in pathological science. The progress perchance is less marked and has been more than once retarded by the inconsiderate adoption of new remedies; yet it has been substantial, and in some quarters remarkable. The treatment of myxœdema, for example, will make this decade as notable for the demonstration of a new principle in therapeutics as the recognition and description of the clinical and pathological features of this remarkable affection distinguished the preceding decade. This subject was suggested by noting in the volume before us the cautious reception given to the surgical treatment of Graves' disease, a line of therapeutics which seems to be justified by riper knowledge of its pathology. The scope of this work has also widened with years, and the present issue contains the first contributions in two new departments—viz, that on diseases of children (medical) and that on bacteriology. The former has been assigned to Dr. Dawson Williams, the latter to Dr. William Hunter, who has wisely preferred to take up one subject only in this fertile field for consideration in this volume. He is thus enabled to put the reader in possession of the essential facts in the remarkable researches upon tetanus and its treatment that have been made of late. It is unnecessary to say that the publication maintains the high level it has throughout aimed at. This might be expected from such contributors as Mr. Stanley Boyd, Dr. Mitchell Bruce, Professor Corfield, Mr. Field, Dr. Herman, Dr. Maguire, Mr. M. Morris, Mr. E Owen, Dr. S. Phillips, Mr. Power, Dr. Rolfe, and Dr. Skerritt—to name only a part of the staff.

A Handbook of Medical Pathology. By W. P. HERRINGHAM, M.D., F.R.C.P.; A. E. GARROD, M.D., F.R.C.P.; and W. J. GOW, M.D., M.R.C.P. London: Baillière, Tindall, and Cox. 1894.

ONE excellent feature of the medical schools of London is the presence in them of anatomical and pathological museums of exceptional value. These collections subserve in the main two ends, each of great importance: the one is that of a permanent record of the structure of the body and its lesions in disease—a record to be consulted and utilised by scientific investigators; the other, and more immediately useful, is their employment as a chief educational means. We believe that each of these museums has now its printed catalogue—a boon to the investigator that is inestimable. For the student, however, something more is wanted than the mere description of individual specimens. He requires to be told what the specimen illustrates, and how the characters it exhibits come under the special type; he requires, also, a judicious guide who shall select those preparations that convey the best information—the common rather than the rare. It was, therefore, with pleasure that several years ago we welcomed Mr. Walsham's admirable guide-book to the surgical pathology of the museum of St. Bartholomew's Hospital. It was a new departure, and a wise one. That work has, we are glad to know, been well received and appreciated. From the same school we have now to chronicle the appearance of a similar hand-book, devoted to the sphere of medical pathology. The authors have fulfilled their task with much ability, and their students must be grateful to them; for with this book in hand, and studying the specimens upon which it is based, they will be able to gain a knowledge of pathology far more exact and far more useful than reading alone can furnish. At the same time, just as the study of anatomical preparations cannot replace the work in the dissecting-room, the student must not be beguiled by the completeness and excellence of such museum guides into neglecting the invaluable opportunities for the study of morbid anatomy in the post-mortem room. The basis of practical medicine lies in pathology, and full advantage should be taken of each of the departments in which its study can be pursued.

LIBRARY TABLE.

Ventilation and Heating.—By JOHN S. BILLINGS, A.M., M.D., LL.D. Edin., D.C.L. Oxon., &c. New York: The Engineering Record. 1893.—This volume of 500 pages is a really able and useful work, and not only a convenient but, we may say, an essential book of reference for those engaged in public health work, architecture, hospital construction, and engineering generally. It is admirably and profusely illustrated, and the author discusses the subjects of which he treats in a scientific and exhaustive manner. The book contains, in short, a vast amount of reliable information on a variety of subjects, which has been brought up to date and cannot be elsewhere obtained. Its author is a man of deservedly high reputation and scientific attainments, and he has enjoyed the advantage arising from considerable personal experience and observation of the methods and systems followed in many different countries.

The Physician's Testimony for Christ By the late Sir ANDREW CLARK, Bart., with a Preface by Sir DYCE DUCKWORTH. The Christian Evidence Society. 1894.—The testimony of physicians to the great founder of the Christian religion and to its truth has always been considered interesting, from that of Sir Thomas Browne downwards. The author of "Religio Medici" said: "Having in my riper years and confirmed Judgment seen and examined all, I find myself obliged by the Principles of Grace and the Law of mine own Reason to embrace no other Name but this." Readers of the testimony of perhaps the busiest physician of our generation will find that he, 250 years afterwards, is obliged to do the same. It is not for us here to go into the reasons of his faith in "this most universal man that ever lived on the face of the earth"—a faith which Sir Andrew Clark never concealed, though he held it in perfect charity to all men; but he gives his reasons in his own clear and emphatic way in his address delivered at the annual meeting of the Christian Evidence Society in 1890 The preface by Sir Dyce Duckworth is short, pointed, and sympathetic.

JOURNALS AND REVIEWS.

The Journal of Physiology. Edited by MICHAEL FOSTER, M.D., F.R.S., and J. N. LANGLEY, M.A., F.R.S. Vol. XVI. Nos. 1, 2, 3, and 4. London: C. J. Clay and Sons. March and April, 1894.—The appearance within a month of four numbers of this journal containing many papers of value gives promise that the productiveness of the school of young physiologists growing up in Cambridge, Oxford, London, and abroad will soon severely tax the capability of any reader, however industrious, to keep pace with their activity. The following is a list of the more important ones:—1. S. Ringer and H. Sainsbury: on the Action of Potassium, Sodium, and Calcium Salts on Tubifex Rivulorum. 2. W. M. Bayliss and J. Bradford: on the Innervation of the Vessels of the Limbs, with a plate. 3. F. Gourlay: on the Proteids of the Thyroid and the Spleen, with a plate. 4. J. R. Bradford and H. P. Dean: on the Pulmonary Circulation, with two plates. 5. V. Harley: on the Value of Sugar and the Effect of Smoking on Muscular Work, with two figures in text. 6. J. S. Haldane, W. H. White, and J. W. Washbourn: An improved form of Animal Calorimeter, with figure in text. 7. E. H. Starling and A. H. Tubby: on Absorption from and Secretion into the Serous Cavities. 8. R. Boyce: Note on the Degeneration of the Roots of the Fifth Nerve. 9. W. M. Bayliss and E. H. Starling: Observations on Venous Pressures and their Relationship to Capillary Pressure, with three plates and three figures in text. 10. E. W. Reid and A. G. Tolputt: Further Observations on the Electro-motive Properties of the Skin of the Common Eel, one figure in text. 11. E. H. Starling: the

Influence of Mechanical Factors on Lymph Production. 12. A B. Macallum: on the Absorption of Iron in the Animal Body, with a plate. 13. W. H. Howell, S. P. Budgett, and E Leonard: on the Effect of Stimulation and of Changes in Temperature upon the Irritability and Conductivity of Nerve Fibres, with a plate. The last part contains, in addition, the Proceedings of the Physiological Society.

Annals of Ophthalmology and Otology. Edited by J. PLEASANT PARKER, M.D. Vol. III., No. I. January, 1894. Saint Louis, Missouri, U.S.A.—The present part contains several interesting articles. Dr. Chisolm contributes a paper on How Cataract Patients' Eyes are dressed at the Presbyterian Eye, Ear, and Throat Charity Hospital of Baltimore. From this it appears that Dr. Chisolm cleanses his instruments by boiling in water for five minutes, washes the conjunctival surface with a lotion containing perchloride of mercury in the proportion of 1 to 4000, that he uses cocaine and operates without iridectomy, and that he applies a cotton-wool pad and bandage and only closes the eye on which he has operated. Dr. Risley, Dr. E. Jackson, and Dr. Schweinitz give details of cases in which hæmorrhage followed the extraction of cataractous lenses. Dr. Landman reports two cases of Monocular Polyopia. Dr. Hotz describes a simple form of Astigmometer, which he claims to possess high diagnostic value. Dr. Oliver gives an account of a new and convenient Trial Frame, and Dr. Weiland an account of a new Optometer for the Correction of Astigmatism. Dr. Gould attributes Heterophoria to some defect of the nervous system and gives a new method of treating it. Dr. Prince gives Some Aids to Accuracy in the Correction of Astigmatism. Dr. Howard Hansell discusses the treatment of Internal Squint. Dr. Casey Wood continues an article on the Toxic Amblyopias. Dr. Randall supplies Statistics of Ear Disease derived from nearly 5000 cases. Dr. Seiss gives the treatment of Tinnitus in Aural Sclerosis, and there are several other papers on affections of the ear.

The Quarterly Journal of Microscopical Science. Vol. XXXV., Part 4. Edited by Professors LANKESTER, SEDGWICK, and WELDON. London: J. & A. Churchill. March, 1894.—This part contains: 1. A long, carefully drawn up, and well-illustrated article by A. A. W. Hubrecht of Utrecht on the Placentation of the Shrew, which animal the author states presents in its development very few points of agreement with the hedgehog, a group that was the subject of a previous paper. Amongst other points he shows that the placenta of the shrew is essentially an embryonic neo-formation, which is permeated by maternal blood that circulates in spaces devoid of endothelium. 2. R. T. Günther gives some further contributions to our knowledge of the Minute Anatomy of Limnocodium. 3. A. Fraser Dixon: A Note on the Mesenteries of Actinians. This part completes the thirty-fifth volume of the journal.

Analytical Records
FROM
THE LANCET LABORATORY.

CURTIS'S MEAT JUICE.
(CURTIS AND CO., 48, BAKER-STREET, W.)

Our analysis shows that this preparation consists, as stated, of the juice of fresh beef expressed in the cold. A dilute solution of the juice in water gives accordingly, when viewed with the spectroscope the two absorption bands characteristic of hæmoglobin, and on boiling the solution the albumens coagulate, carrying with them the red colouring matter, so that the clear solution no longer exhibits the spectrum peculiarity. Quantitative examination yielded the following results: water, 63·53 per cent.; meat principles, 29·93 per cent., containing 5 per cent. nitrogen; mineral matter, 6·54 per cent. It is, therefore, a beef juice of a fair degree of concentration, in which the nourishing properties are contained unimpaired.

PURE GRAPE BRANDY.
(F. CANTON AND CO., 35, GREAT TOWER-STREET, E.C.)

We have obtained no evidence that this brandy is other than is implied by its name. It is smooth and mellow to the taste and yields results of analysis in accordance with those furnished by the genuine spirit. They are as follows: absolute alcohol, by weight 38·67 per cent., by volume 45 89 per cent.—equal to 80 43 per cent. proof spirit; extractives, 1·32 per cent.; mineral matter (tinged with iron), 0·02 per cent. It is said, and we have no ground for doubting, that it is composed of pure French brandy landed here prior to 1878 (the year when the phylloxera devastated the French vineyards) and blended with pure grape brandies from California, Algeria, and Spain, matured in bond. Though containing a somewhat low proportion of alcohol, it is entirely free from the raw products which are the accompaniment of spirit produced from potatoes and cereals, while the first fraction that passes over on distillation exhibits the fragrant etherial smell which is an especial characteristic of true cognac. Experiments on the relative clinical value of brandy produced from various sources are wanting, but we learn that this specimen has given very favourable comparative results.

SPECIMENS OF JELLY AND GELATIN.
(ASTLEY, COOPER, AND CO., OATLANDS CHEMICAL WORKS, MEANWOOD-ROAD, LEEDS.)

An examination of these preparations was mainly directed towards finding evidence of the presence of residues which could be attributed to certain chemicals used in bleaching and for the preservation of gelatines and allied products. The tests that were made, however, elicited an admirable degree of purity and transparency in each and all. A small quantity of mineral matter was obtained on ignition, which proved to consist principally of phosphate, derived, of course, from the bone, and in some cases traces of carbonates, sulphates, and chlorides. The specimens examined were as follows: (1) pure crystal table jelly, said to be made from the heels of calves' feet, flavoured either with lemon or orange; and (2) gelatin, unbleached, thin and thick, and two varieties of the same also, but bleached. They are well suited for table use or even for the delicate requirements of bacteriological work.

SAVOURY CHEESE AND ANCHOVY CHEESE.
(THE GLOUCESTER DAIRY ASSOCIATION, GLOUCESTER.)

The above are the names given to two novel dairy products, which will be welcomed by those who are fond of piquant delicacies. The taste of the former, though somewhat pungent, resembles Stilton cheese, while the latter evidently contains a *soupçon* of a sauce of the character of a relish. Both preparations are eaten to the best advantage in the form of a paste, but the statement that they are well adapted for invalid use can only be borne out by experience. In view, however, of this recommendation, it is satisfactory to find that both the anchovy and savoury cheese were free from objectionable preservatives.

CALIFORNIAN WINES.
(GRIERSON, OLDHAM, AND CO., 11, REGENT-STREET, PALL-MALL, S.W.)

The rapid growth and development of viniculture in California is proof of the popularity which these wines are deservedly attaining. The industry is still, of course, in its infancy, and the wine produced, though comparing very favourably with the wines reared in France, where the land has been so long under cultivation and where the art has received centuries of study, cannot be expected to equal their delicacy. Nevertheless, the wines of California, types of which known as the "big tree" brand we have recently

examined, possess sound qualities, of which tone and vigour are predominant. Their chemical composition, as will be seen from the following results of analysis, closely resembles the products of better known and longer established vineyards. Chablis, No. 5: alcohol, by weight 10·00 per cent., by volume 12·40 per cent.; extractives, 2·26 per cent.; mineral matter, 0·26 per cent. Burgundy, No. 12: alcohol, by weight 9·71 per cent., by volume 12·5 per cent.; extractives, 3·06 per cent.; ash, 0·40 per cent. Hock, No. 7 (Johannesberg Riesling): alcohol, by weight 8·36 per cent., by volume, 10·33 per cent.; extractives, 3·04 per cent.; ash, 0·23 per cent. It will occur to many that, while the price of these wines is moderate, yet the cost and conditions of production are so favourable as to enable the grower to place an undoubtedly genuine article and an abundant supply on the market.

REMY'S PUDDING POWDER.

Under the microscope this preparation is seen to consist entirely of finely and uniformly reduced rice starch. It is beautifully clean and white and is therefore calculated to add very favourably to the appearance of cooked foods, for the preparation of which it is well suited.

RIGOLA, OR EXTRACT OF GERM, AND GERM WHITE BREAD.

(THE MALTO-GERM EXTRACT COMPANY, LIMITED, 152, BERMONDSEY-STREET, S.E.)

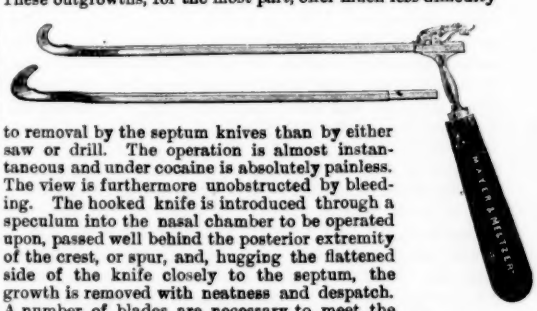
The addition of "rigola," or "liquid extract germ of wheat," to dough is calculated to raise the food value of the resulting bread, since, according to our analysis, it is a preparation which possesses distinct starch digestive power and contains besides a trustworthy proportion of soluble phosphate. Thus, such an admixture would lead to an increase in the proportion of soluble carbohydrates in the bread, part of the starch being converted into dextrine and sugar, while an important enrichment of mineral constituents, a definite proportion of which is essential, would be correspondingly effected. An analysis of germ white bread which is prepared on these lines fully bears out this view, for the proportion of soluble matter is distinctly greater than in ordinary bread, and an excellent yield of phosphatic material was found in the mineral matter. Apart also from the improvement in taste, a commendable feature of the loaf so made is its property of remaining moist for a longer time. Biscuits prepared in a similar way were equally satisfactory.

PORT ELIZABETH PROVINCIAL HOSPITAL.—From the *Port Elizabeth Telegraph* of Feb. 15th last we learn that this hospital continues to prosper and to do good work. The managers propose to build a new ward for female patients at a cost of £2000, the ward at present in use being small and inconvenient. We notice that the hospital has an annual grant of £3000 from Government, with £200 additional for a children's ward; the sum of £786 4*s.* 2*d.* was received in 1893 from 190 paying patients. The patients under treatment in 1893 numbered 1146, the deaths being 96, making a mortality of 8·3 per cent. A decided increase in typhoid fever in the past year is noted. The average residence of patients was 22·8 days, the average cost per patient being 4*s.* per day. Fifty-three major operations were performed; anæsthetics were given to 96 patients without casualty. The out-patients numbered 5048; under this heading the following very sensible remark is added: "We are glad to note a slight annual decrease in this department, as we consider it indicates a less degree of poverty in the town and also that greater care is shown that those able to pay for their medical treatment shall not take undue advantage of the institution." Would that hospitals nearer home could show a similar reason for rejoicing. The report closes with a graceful reference to the retirement of Dr. Ensor from active duty, and the hope is expressed that as consulting surgeon Dr. Ensor may still be able to place his mature and valued opinion at the service of the hospital.

New Inventions.

A NASAL SEPTUM KNIFE.

THE knives as illustrated are intended for the removal of cartilaginous and bony crests or spurs from the nasal septum. These outgrowths, for the most part, offer much less difficulty



to removal by the septum knives than by either saw or drill. The operation is almost instantaneous and under cocaine is absolutely painless. The view is furthermore unobstructed by bleeding. The hooked knife is introduced through a speculum into the nasal chamber to be operated upon, passed well behind the posterior extremity of the crest, or spur, and, hugging the flattened side of the knife closely to the septum, the growth is removed with neatness and despatch. A number of blades are necessary to meet the varying conditions found in nasal deformities. The universal handle fitted with a spring catch will be found both strong and convenient. The above instrument has been made to my designs by Messrs. Mayer and Meltzer, London.

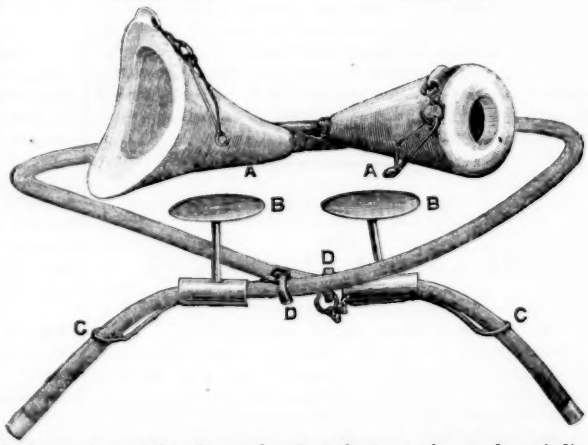
Montreal. GEORGE W. MAJOR, M.D.

A NEW FORM OF URINAL.

WE have received from Messrs. Reynolds and Branson of Leeds particulars of a new form of urinal adapted to male and female use. The apparatus, which strikes us as undoubtedly ingenious, is due to the invention of Mr. Butcher, a working-man of Sunderland. The advantage obtained for it is that the patient can attend to him- or herself whenever he or she has need, instead of being compelled to trouble another, and it will be readily understood that this would often be a real advantage in a small household.

Instructions for use.—Place the conduit in the bed between the sheets and attach the spring A to the bottom sheet until required. B is to be placed between the lath of the bedstead and the mattress; in case of a spring mattress it is only necessary to unscrew the top and place the rod through be-

FEMALE USE. MALE USE.



tween the wires, and replace the top again. C shows india-rubber tube hanging over the utensil under the bed. D is a rubber ring to prevent the rubber tube from slipping through the guide. The receptacles are in each case made of porcelain, and the female one is constructed with inverted lips on what may be termed the "unspillable inkpot principle."

THE LANCET.

LONDON: SATURDAY, MAY 26, 1894.

THE business of the General Medical Council grows both in amount and in seriousness. The agenda on the first programme of work for the session contained from thirty-five to forty resolutions on various subjects, and looked like material for eight or ten days' work. Some of these were, of course, almost formal. Others were of the first rank of importance, affecting sometimes the very reputation of medical authorities, at other times the professional status of the individual members of the profession. The address of the President showed, as usual, a very good grasp of the subjects with which the Council had to deal. There have, perhaps, been Presidents with more power of ornate exposition than Sir RICHARD QUAIN, but there have been none with a keener or quicker insight into the essential bearings of the many questions that arise for the Council's consideration, or with more business-like faculty for disposing of them. One remark in his address especially will commend itself to the profession and to the public as worthy of much consideration. Alluding to the tendency in high-class public schools to push the teaching of science, for which there is much to be said, he expressed the fear that this may be done at the cost of time that should be devoted to subjects relating to general culture. These two great objects of education must not be allowed to be brought into conflict with each other, and the President's note of warning will be endorsed by all sound authorities on education.

The Council got through a great amount of work on the first two days of its sitting. On Tuesday an important resolution regarding the tenure of appointments of surgical examinerships in the Apothecaries' Society was passed. Our readers are aware that under the Act of 1886 the surgical examiners are appointed by the General Medical Council. The appointments made at first were for no definite time and have lasted ever since. This is contrary to the rule of such offices, and it was felt to be desirable both by the Society and by the examiners themselves that a fixed time should be stated. It was resolved that one of the examiners appointed by the Council shall retire annually and not be re-eligible for two years, and that henceforth such appointments shall be made for five years only. On the same day the Council received a report by its solicitor in regard to the case of JOSEPH STEEL, who lately appealed unsuccessfully to the Court of Queen's Bench against his conviction at Houghton-le-Spring for the use of the title M.D. (Bc.) conferred on him by the so-called General Council of Safe Medicine. The action of the Council in prosecuting this outrageous pretension has been so far very successful and satisfactory; but it is obvious that the matter cannot rest where it is, and the Council, on the motion of Mr. WHEELHOUSE, seconded by Dr. GLOVER, resolved that "the President, in conjunction with the legal advisers of the Council, shall take such steps as may be thought advisable to put an end to the granting of so-called degrees by the General Council of Safe Medicine." Surely some means may be discovered of "putting an end" to the notion that any group of individuals may club together and call themselves a medical council and grant medical degrees. If not, our medical legislation is without meaning.

Two other subjects of great interest occupied the time of the Council on Tuesday. One of these was somewhat unexpected and came from an unexpected quarter. Mr. BRYANT introduced the question of Medical Aid Associations in a long and somewhat vague motion, and reverted to the discussions of last year and showed how the report of the committee had demonstrated the unsatisfactory conditions on which these appointments are held in respect of their excessive work, their inadequate pay, and the subjection of the holders to a strong and purely lay committee. It was soon apparent, however, that if this subject was to be revived it must be in a more formal and definite manner than was involved in Mr. BRYANT'S motion, which in the end he withdrew. It was remarked at the Council that he and Sir DYCE DUCKWORTH, who seconded his resolution, did not give their votes last year in favour of the resolutions on this subject put forward by the responsible committee. Mr. BRYANT explained this by saying that these resolutions were not quite strong enough; but sometimes half a loaf is better than no bread, and it is certainly often attainable when the whole is not so. The discussion, however, was interesting and will not fail to convince the authorities of Friendly Societies that they will do well to treat their medical officers much more seriously than they do, and to convince medical officers that it is their duty in accepting such offices to have regard to the dignity of medical work and the real interests of the patients whom they undertake to treat.

An equally animated debate took place on the question of the documents or testimonials given to midwives by the Obstetrical Society and other societies, and by the authorities of various Lying-in Hospitals, and on various petitions presented by Dr. RENTOUL and by various societies on the subject of these certificates and of midwives generally. On the motion of Sir WALTER FOSTER, seconded by Dr. GLOVER, these documents were entered on the minutes and the profession can there study them as a curiosity in the future. They are undoubtedly unwarranted, and in some cases purport to be actual diplomas. Mr. WHEELHOUSE proposed that those who granted them should be regarded, after next January, as guilty of infamous conduct in a professional respect. Sir WILLIAM TURNER proposed an amendment expressing much the same views in a more euphemistic form. Let us hope in any case that the discussion will bring down these documents to a more modest and less misleading form.

Wednesday, the second day of the Council's session, was occupied continuously in hearing charges of unprofessional conduct. No less than five practitioners in succession were found guilty of infamous conduct in a professional respect. The Registrar in each case was ordered to erase their names from the Register. Some of these removals were for covering unqualified practitioners. Others were for discreditable and unprofessional systems of advertisement. In one of the cases the culprit was a lady practising in Australia. The condemnation of the Council was richly

deserved. It is due to the lady members of the profession to say that this is the first instance of a lady being charged with such conduct, and it is creditable to the London School of Medicine for Women that they have done their best to bring the delinquent under the notice of the authorities who alone can deal with such conduct.

THE most authoritative of Italian periodicals—the *Nuova Antologia*, which aspires, not without success, to do for Italy what the *Revue des Deux Mondes* has long done for France—contains in its current number a retrospect and a criticism of the recent International Medical Congress held in Rome. The writer sets out by admitting the confusion that characterised the arrangements and impaired the usefulness of the gathering; but he endeavours to find an explanation, if not an excuse, for it in the "numero ingente ed inaspettato di intervenuti in una capitale poco popolata e meno adatta a tale improvvisa valanga di ospiti" (immense and unexpected number of Congressisti in a capital not very populous and still less adapted for so sudden an avalanche of guests). We have no wish to reopen a subject already sufficiently dealt with in these columns; but if a space of three years, supplemented by a postponement of six months, is too short a time for an organising committee to make its dispositions we may despair of ever seeing another Congress exempt from the cross-purposes, irregularities, and general frustration of business which left two-thirds of the programme of this last one a *res infecta*. The truth is that the Roman committee imperfectly realised what it had undertaken—so much so, indeed, that within a few weeks of the opening day it was still holding out inducements for the intervention of a world remotely connected with the healing art, and offering facilities not only for first-year's students to attend, but even for outsiders of both sexes whose interest might be expected to lie in the social rather than in the professional branches of the programme. The adaptation of means to ends is the primary condition of all successful organisation; but so small practical force had this for the Roman committee that it remained ignorant of the resources of the city in accommodation up to the eleventh hour, while in the matter of papers to be read and discussed it not only kept open the interval during which these might be sent in to a date that encouraged the procrastinating contributor, but even extended it so as to tempt others, who had no original intention of so doing, to swell the already unmanageable number of *communiqués*. The writer in the *Nuova Antologia* notwithstanding, we have too high a respect for the judgment and resource of the profession in Italy to suppose that the lessons conveyed by the Roman Congress will be thrown away on the organisers of the next one which may be held in some other of the great university towns of the peninsula.

With one point made in the *Nuova Antologia* we can fully agree. "It is a fact," says the writer, "beyond all dispute that the Roman Congress has registered the apogee of International Medical Congresses; and without fear of making a false prediction we may anticipate, from this period onward, a steady decline in their magnitude." Everything here below, he virtually adds, has its day, and everything ends in weariness. There is, indeed, no human institution which has not to describe the inexorable parabola of which Rome has incontestably marked the most culminating point in the curve of congresses (*nella curva dei congressi*). This is sound sense as well as safe prophecy, and, indeed, is the inevitable conclusion to be drawn from the "record-breaking" spirit which, as already noted in THE LANCET, has begun to invade even scientific reunions, especially of the international order. A wiser conception of what such meetings can effect will replace the exaggerated estimate hitherto formed of their capabilities, while reform in their constitution and procedure will be conducted on lines which will concentrate on points of greatest common interest the most enlightened and best-inspired energies of research and practice. "The healing art," continues the *Nuova Antologia*, "advances only by the calm, unclouded work of the laboratory and by the patient study of morbid manifestations at the bedside, not by the hasty, tumultuous discussions of a universal gathering, where the Babel of tongues distracts attention and impedes the just appreciation of argument." The medical sciences are tending to coalesce into separate spheres of professional activity, assuming the form of associations, which again periodically meet in congresses or "accademie intermittenti," as the *Nuova Antologia* happily calls them, in which, without unreasonable restriction as to time, discussions really exhaustive and instructive can be brought to a practical issue. The medical press, moreover, diffuses the acquisitions made in the laboratory and the clinique so thoroughly, so widely, and so promptly as greatly to minimise the necessity for such gatherings as those colossal ones at Rome and Berlin. The medical writer cannot wait for three years before bringing his experience or his suggestions before the world, but reads them to a local reunion of the profession, or publishes them forthwith in one of the medical periodicals. The gist of the *Nuova Antologia's* argument is simply this: that congresses subserve the useful purpose of bringing contemporary workers face to face and into personal contact, when half-an-hour's conversation does more to induce a common understanding and bring the said workers harmoniously into line than a whole afternoon's discussion in this or that section is capable of. There is much to be said for this view of the utility of such meetings, contributing as these personal exchanges of experience undoubtedly do to that economy of time on which Professor MICHAEL FOSTER laid so much stress in his recent lecture. More than this advantage of effecting introductions and comparison of notes between representative individuals the *Nuova Antologia* refuses to concede to triennial congresses, while it sees another direction in which the Roman experience can be utilised for the still further benefit of the healing art. That direction is the exhibition of medical objects of interest on the scale of the recent "Esposizione" in the Eldorado. There is no doubt that a triennial "world's show" of the "materia medica" in its largest sense, including the latest acquisitions of hygienic reforms or the most recent and approved appliances of the Red Cross, would be of immense utility in stimulating wholesome emulation and bringing the implements of the practitioner or sanitarian ever nearer perfection. We only demur to the writer's argument when he laments the apathy of the lay public towards the Eldorado and its "Esposizione."

It was for the most scientific of the profession, mainly foreigners, he says, that the exhibit seemed to have exclusive interest. The rank and file of the Congress, and even the technically qualified of the Italian professions, hardly looked at it. The fact is significant, but rather as illustrating what we contend for — namely, a more purely scientific character in the succeeding congresses, manifesting itself in a restricted and well-chosen programme susceptible of being gone through exhaustively, instructively, and with sound practical results—a programme to which the Exposition would be the complement, appealing to none but those who are professionally interested as investigators and practitioners. The falling-off of the lay public would then be a subject for congratulation, not a misfortune to be deplored, and international congresses would fulfil a higher and more useful purpose than the latest and most imposing of the series was capable of carrying out.

IT is difficult for anyone interested in the progress of preventive medicine to note without a little disappointment the diverse views which obtain among the several sanitary authorities who have added measles to the list of notifiable diseases as to the value of the proceeding. A disease which in this country exacts a death-toll of from 6000 to 14,000 persons annually, and an uncertain but far from insignificant amount of partial disablement for life, cannot be a matter of indifference to us; more especially so when we have regard to the fact, as indicated by the rise of mortality during the last decade, that the disease may possibly be undergoing intensification of type. It is, we take it, hardly possible to state at the present time how far the want of accord referred to may be due to diversity of method in dealing with the notified cases, and to the varying stages of local outbreaks at which notification may have been commenced. For instance, it would be absurd to compare localities where notification is adopted in the midst of an outbreak, and where notification is both the beginning and the end of special action, with those where notification starts at the lowest point in the measles curve, and is followed up by isolation, disinfection, and proper precautions as regards school attendance. Furthermore, in dealing with measles, a disease in which medical advice is often not sought at all even though the nature of the complaint is evident to the parents, it is probable that nothing short of a rigid insistance on *dual* notification will be likely to bring about anything like a satisfactory issue. Looking, too, at the cyclical tendency of the disease, it is of course important—indeed, essential—that the trial of a system of notification should extend over a sufficient number of years to warrant a sound inference being drawn, and that notification should not be repealed because of the mere fact that the cost of the certificates forces itself upon the notice of a sanitary authority who, since adding the disease to the list, have not temporarily or otherwise to a corresponding extent increased their epidemic staff and plant. The whole business of notification must be dealt with gently and in a judicial spirit, and the possibility must not altogether be lost sight of that if dual notification were to be suddenly enforced in a rigid fashion in dealing with a disease so widespread as measles, the poorer classes might so resent it as, at any rate for a time, to partially defeat the object in view. The fact is that the whole matter as regards notification of measles is still *sub judice*, and more knowledge is required before we can lay down any definite dicta with regard to the circumstances under which measles may be notified with profit. It is, we believe, a recognition of this fact, and of an increasing infantile mortality occasioned by measles, which has led the Local Government Board to institute an inquiry, which is still in progress, and which has for its aim the complete understanding of all the circumstances connected with the subject. When this inquiry is reported on we may look forward to some valuable and interesting information. It is to be hoped, too, that the medical officers of health of all districts where notification of measles is in force will give detailed accounts of their operations in their annual reports, so that by this means there may be, as it were, an interchange of experience on this important question.

Annotations.

"Ne quid nimis."

THE GOLDEN WEDDING OF SIR JAMES PAGET.

FEW events in the domestic history of the profession can excite more interest than the golden wedding-day of Sir James and Lady Paget, which was celebrated on Wednesday last. The General Medical Council that day, very happily, through its President, passed a resolution of congratulation, and in that way gave expression to a sentiment which will be universal throughout the profession in Europe and America. The life and character of Sir James Paget are a part of the property and history of the profession of this century. And it is a matter of the deepest satisfaction that he still enjoys the society of Lady Paget, who has so well accompanied and supported him for fifty years in his eventful and honoured life. The public little knows how much its great men owe to the help of congenial partners. It only remains for us to express a wish for many happy years of usefulness for Sir James and Lady Paget.

SMALL-POX WARNINGS.

A VERY serious responsibility rests at present on all sanitary authorities in the matter of small-pox. It is known to all of them that there are in their several districts a large number of unvaccinated children and of grown up persons who have not been revaccinated. It is also known to them that most unpleasant indications of a general revival of small-pox exist. The least they can do is to publish a distinct note of warning to their constituents. We are glad to see that the sanitary authorities of Islington are discharging their duty in this respect. The walls of the parish are placarded with posters intimating the presence of small-pox in various parts and stating the arrangements for public vaccination, and urging on all classes the necessity for care in this respect. We learn from a return just made by the medical officer of health (Mr. Harris) to his committee that the proportion of children whose vaccination is not accounted for is 10·87 per cent., or, rather, this was the proportion in 1892. The figures for 1893 are not yet made out. But the proportion of the unvaccinated has been steadily increasing of late years. The facts are still more serious in many provincial towns, which are likely to pay dearly for listening to the fads of anti-vaccinationists. All sanitary authorities should do what is being done in Islington. Many thousands will take the suggestion, and

those who reject it will only have themselves to blame. Among the most striking points brought out by Mr. Harris in the returns to his committee of the cases of small-pox that are springing up in all parts of his district is the difficulty of tracing the origin of the infection. In case after case occurs the remark "origin unknown." Many of those who rely on sanitary police and not on revaccination will find themselves resting on a broken reed. Thanks to vaccination, much of the small-pox that occurs is mild, scarcely recognisable but by an expert. Such cases may give rise to grave and even deadly attacks in others. The patients may not be laid up. They may go about their duties in the house, or even travel in railway trains and trams, and spread the disease as our weekly reports show that it is spread. In such circumstances the least sanitary authorities can do is to publish the facts and to point out the wisdom and duty of vaccination. Those who prefer the larger of two evils can then take their choice.

LIGHTNING STROKE.

"BALL LIGHTNING" the *fulmen globulare* of the older meteorologists, is the most dangerous and destructive of the forms which lightning is known to assume. Fortunately, however, it is the rarest. A narrow escape from death by its stroke occurred lately in the person of a distinguished surgeon of the Belgian school, Dr. L. Dandois, Professor of Surgery in the University of Louvain, who had gone to the neighbouring town of Linden to visit a patient, and on his return, having alighted from the train to continue his homeward journey by road, was overtaken by a heavy thunderstorm. The sky became as dark as at midnight, so as to make it difficult for him to avoid the telegraph-poles standing at intervals along his path. In a few minutes a fire-ball, as he described it, descended on him, its stroke hurling him off the road, across the ditch that ran parallel to it, and landing him in the adjacent field. He was holding a large umbrella at the time, holding it with both hands by its wooden stick, which was of uncommon thickness. On coming to himself after the shock he found the umbrella cover completely burnt off its steel framework, the steel itself being twisted into every sort of shape. The wooden handle had no doubt saved his life—had it been of metal Dr. Dandois is convinced that he must have been killed instantaneously. As it was, fully ten minutes elapsed before he recovered the use of his arms and legs, benumbed as they were with the shock. Ultimately he was able to resume his walk homeward.

AWARDS AT THE INTERNATIONAL EXPOSITION OF HYGIENE IN ROME.

THE German exhibitors figure prominently in the official list of awards made by the jury of the International Exposition of Hygiene held concurrently with the International Medical Congress in Rome. From the report of the Exposition already given in our columns, the reader will be prepared to find that the Imperial German Gesundheitsamt received the highest award (the great diploma of honour); while minor honorary diplomas were given to the Prussian War Office, to the City of Berlin, to the Bavarian Ministry of the Interior, to the City of Munich, to the Home Office and War Office of Saxony, and to other bureaux (Government and municipal) of the Fatherland, as well as to Professors Salkowski, Kossel, and Brieger of Berlin; Jaffé of Königsberg; Kühne of Heidelberg; Drechsel of Bern; and C. Zeiss of Jena. The gold medal was obtained by the Anilin-Fabrication Company of Berlin; by Schering of Berlin; by Merck of Darmstadt; and by two other German houses; while silver medals were literally showered on exhibitors of the same nationality for contributions to sanitary *matériel*. Amongst the recipients were professors in the various seats of learning throughout the Fatherland—Berlin in point of numbers heading the list. Italy, again, is well satisfied with the appreciation of her mineral waters embodied in the awards of the jury. On the court representing the Hydrological Department were the "Dean of French Hydrology," Professor Labat of Paris, and the head of the German hydrological societies, Professor Winternitz of Vienna, while Italian jurymen were the Senator Dr. Giulio Bizzozzero, Professor of General Pathology in the University of Turin, and Dr. David Borelli, Professor of Clinical Medicine in the University of Naples. Among mineral waters, Italian and foreign, the highest award was given to that of Fiuggi, which received the silver-gilt medal; silver medals were adjudged to Decref (Madrid) and Perrin (Vichy) for their waters; and the Giesshübl-Puchstein, the Franz Josef Bitterquelle, and the Tuscan Cinciano received bronze medals. Fiuggi, to which the place of honour has been assigned, is a water of great antiquity, which, like many good things Italian, has been allowed to fall into desuetude till now, when a vigorous effort is being made to reinstate it in the popularity it enjoyed in mediæval and classic times. Its source is in the Hernican country to the south of Rome, a beautiful tract of the Apennines celebrated by Virgil, and its efficacy in subjects of the uric diathesis is attested by clinicians of the stamp of Dr. Guido Baccelli, President of the Eleventh International Medical Congress, the Senator Dr. Mariano Semmola, Professor of Clinical Medicine in the University of Naples, and, indeed, by nearly every consultant of note throughout the peninsula. It ought certainly to be better known in this country, as its virtues, especially in gastro-intestinal catarrh—notably, such as proceeds from uric and oxalic concretions—have been attested by British medical men practising in Italy.

THE NEW TAX ON SPIRITS.

A RECENT letter in the *Chemist and Druggist* sums up succinctly from the wholesale pharmaceutical chemist's and druggist's point of view the position under the spirit taxes as proposed in the Budget resolutions of Sir William Harcourt. After referring to the important part which spirits play in pharmaceutical preparations, the writer compares the position of the English pharmaceutist with that of the pharmacist and manufacturer on the Continent, who has "special privileges in regard to alcohol used solely for medicinal purposes," and from whom duty is not exacted to the same extent that it is from traders in alcohol for other purposes. Coöperation is suggested as a means whereby the English pharmacist could obtain the concessions necessary to place him on the same footing as the Continental pharmacist. "If all the chemists and druggists of Great Britain and Ireland were united in one society, organised and set up as one man, they might succeed in getting themselves eventually out of the pale of the alcohol dues and out of the company of the spirit retailer and distiller. The additional tax on spirit of wine is a great hardship upon the seller and dispenser of medicines, as it is not practicable that he can in any way recoup himself from the public, and the burden of the tax must necessarily fall upon him almost solely." The writer concludes his argument from the pharmaceutist's point of view by quoting from the Chancellor's Budget speech, in which he says: "These (the duties on spirits and beer) are duties which the House has always had recourse to when it was necessary largely to increase the revenue, and that has been done not upon moral or social grounds, but purely upon fiscal grounds, which are those alone upon which the Chancellor of the Exchequer should act." Discussing the position of the manufacturing druggist, the writer says that whereas formerly the wholesale druggist

was in the main a seller of raw drugs and of but a few manufactured preparations; the modern wholesale druggist, who keeps pace with the times, is a manufacturer, and in his processes is a large consumer of alcohol. The alcohol duties of many of these manufacturers are not less than £5000 a year, and some pay nearly £10,000, and these figures, added to the licensing amounts, form very important items. Analysing the disposal of each 100 gallons of spirit taken into stock in his own laboratory, the writer points out that 15 gallons are sold as spirit of wine to pharmacists; spirit of nitre, sal volatile, and proof and rectified tinctures take altogether 42 gallons; while the remainder is absorbed by concentrated decoctions, infusions, taraxacum and other juices, fluid extracts, and a hundred other preparations of the laboratory. The gist of the letter is this: the brewer is believed to be able to adulterate his wares and yet sell them at the standard price; but the wholesale druggist must make his preparations in accordance with pharmaceutical standards as heretofore. And the additional cost must fall upon his customers, the medical profession and their patients.

THE STREET-CRYING NUISANCE.

NOT a few social grievances flourish in luxuriant growth untrimmed by the pruning hook of reform simply because they do not greatly injure, though they may greatly annoy, a patient people. Among such may be numbered the practice of street-crying. This custom is, of course, not of yesterday. Neither is it without some recommendations. If not the most respectable, it is, within due limits, a legitimate business method. Unfortunately it has also become through excess and mismanagement a generally admitted nuisance. It is not merely the comfort and convenience of householders which are affected by it. The noisy clamour of advertisement is in certain cases positively injurious. If the sick man, thankful to snatch, if he can, broken intervals of sleep, is driven to employ expedients which deaden the sound of passing traffic and even to muffle the knocker on his door, how essential must it be that the shrill street-cry should not reach his ear. There is no question that the abatement of this evil is in every way desirable.

ESSEX AND THE ISOLATION HOSPITAL ACT.

AT the last meeting of the Essex County Council the chairman moved that returns should be obtained from all the sanitary districts in the county of the provisions made for isolating cases of infectious disease. In order that the council might be advised upon the steps they should take to give effect to the Isolation Hospital Act, the Contagious Diseases (Animals) Committee were instructed to report upon the desirability of Dr. Thresh being appointed medical officer of health of the county. This committee met on the 18th inst. Dr. Turner proposed that Dr. Thresh should be chosen medical officer of health for the county at a salary of £1000 a year and should give his whole time to the service of the county. The chairman suggested, as an amendment, that he should be elected medical officer and that by arrangement with the Chelmsford and Maldon rural sanitary authorities he should continue to act for those districts for a total salary of £800. It seemed probable that one or other of these proposals would have been carried had not the clerk stated "that the powers of a county medical officer would be exceedingly limited," and that "he did not see that the Council were called upon to appoint such an officer at present." The result was that both the resolution and amendment were lost, and Dr. Thresh was reappointed to collate reports, &c., upon the old terms. The information which the clerk has obtained regarding the isolation hospital accommodation in the county was ordered to be printed, but what use the Council can make of it without the assistance of a medical officer remains to be seen. We cannot help thinking that the clerk has not made himself sufficiently acquainted with the duties of county medical officers or with the good work which they have done in the counties in which such officers have been appointed. Essex is increasing more rapidly in population than any other county in the kingdom and probably in no other county would the services of an efficient medical officer be of greater value or more appreciated. The County Council, at its next meeting, should appoint a Sanitary Committee and refer the subject to them for further consideration. A committee of gentlemen, specially elected on account of their interest in agriculture to administer the Contagious Diseases (Animals) Act, is scarcely the committee to which the question of the appointment of a medical officer of health should be relegated. The Local Government Board, which has clearly defined the duties of district medical officers of health, might also define those of a county officer. A copy of the memorandum should then be sent to every county council, together with a circular letter expressing the opinion of the Board that the time has now arrived for the councils to carefully consider the advisability of appointing a medical officer to discharge those duties.

SUICIDE IN A HOSPITAL WARD.

A CORONER'S inquest was held on the 19th inst. on the body of a patient who committed suicide in the Charity ward of St. Thomas's Hospital. The patient was a married woman aged thirty-seven, who had been attending an out-patient department for a short time. She had some mental disturbance which followed upon parturition a few weeks previously. It appears that she was admitted with the understanding that she would leave for a convalescent home on the following day, as she had almost ceased to manifest symptoms. She slept at intervals during the night and behaved rationally, but about four o'clock in the morning, during the temporary absence of the night nurse, who had gone into the kitchen attached to the ward, she got out of bed and walked across to the ward table. On this were the bottles containing the usual tests for urine. She took up the bottle containing fuming nitric acid and drank the contents. All the signs of severe poisoning by corrosives rapidly ensued; the patient passed into a state of collapse and died later in the day. The jury returned a verdict of temporary insanity and suggested that the case containing the tests should be placed under lock and key when not in use. It is difficult to arrange for all the testing operations that have to be done in a large ward like the one in which the suicide happened, and the placing of the bottles under lock and key would undoubtedly cause delay in the work of the house physicians and clinical clerks; but we think that the greater safety from accidents thus secured would fully compensate for occasional waste of time.

DEATH UNDER CHLOROFORM.

AN inquest was held at the Tewkesbury Rural Hospital on Thursday, May 17th, touching the death of a lad aged sixteen who died at that institution on the previous day. The deceased was admitted to the hospital on the previous Tuesday suffering from an iliac abscess; and, an exploratory operation, with scraping of an old sinus, being necessary, a mixture of alcohol, chloroform, and ether was administered. The patient showed no signs of nervousness. From the first the anæsthetic was taken quite quietly. There was no struggling, and the breathing was regular. About ten minutes were required to produce complete insensibility. The pupils became contracted and remained so until the expiration of about half-an-hour, when, the operation being almost completed, the breathing suddenly ceased, and the pupils became widely dilated. Before this

there had been no sign of danger, the pulse being good and the breathing easy and regular. The lips had become slightly blue, but no more than might be expected under the circumstances. The operation was at once stopped, the head was brought down over the edge of the table, and artificial respiration was commenced, the back of the throat being cleared of mucus with a sponge. Hypodermic injections of ether and brandy were administered. In one or two minutes the patient began to make inspiratory gasps, but these soon ceased, and though artificial respiration was continued for about an hour, and other means were made use of, breathing was never re-established. The pulse could not be felt after the breathing had ceased. About two ounces of the anæsthetic were used, two-thirds of this being required to produce insensibility at starting. Dr. Wrangham, who administered the chloroform, made a post-mortem examination and found that the brain and membranes were considerably congested. There was a small tuberculous abscess in the apex of the right lung. The heart and other viscera were healthy. Advanced disease of the right sacro-iliac joint was present. His opinion that death was due to syncope determined the verdict.

CHARING-CROSS HOSPITAL.

THE triennial festival dinner held in the Whitehall Rooms of the Hôtel Métropole, at which the Duke of Cambridge, presided, supported by the Duke of Saxe-Coburg and Gotha, was the occasion of urging a special appeal for the needs of this worthy institution. In times past Charing-cross Hospital maintained its financial position, as the Duke of Saxe-Coburg and Gotha (the President of the hospital) pointed out, in a way which compared most satisfactorily with kindred institutions, and was even able to reserve a fund against emergencies. Public subscriptions have, however, so fallen off, and the fixed income is so small, that a deficiency at the present time remains of over £11,000. The hospital has been involved in increased expense by reason of an imperative outlay on sanitary alterations and improvements, while considerable attention had been paid and care devoted to the requirements of the nursing staff, upon which the efficient working of a hospital so much depends. During the three years ending December, 1893, 6801 in-patients and 60,856 out-patients had been benefited by the hospital, and of the cases in the accident ward a very large proportion was derived from accidents that occurred on occasions of public rejoicing and public functions. On such occasions, for instance, as Lord Mayor's Day, Jubilee Day, and the day of the Duke of York's marriage the demands on the hospital were great, on the latter occasion 198 cases having been treated in the casualty room. During the evening speeches were made by the Duke of Cambridge, Sir Joseph Fayrer, and Dr. Black, and subscriptions were announced amounting to £3269 10s. The governors are urgently appealing to the public for support, since, if it is not shortly forthcoming, they will be compelled to close some of the wards.

PROFESSOR BILLROTH'S SUCCESSOR.

WE make no apology for returning to this theme. The post of Lecturer on Clinical Surgery in the University of Vienna has, as we quite anticipated, fallen to Billroth's most distinguished pupil, Vincenz Czerny of Heidelberg. There are circumstances connected with the new appointment, however, which call for special notice. In the spirit of his master, whose traditions he has laboured to perpetuate, Czerny — in conjunction with his fellow-student at the Vienna Clinique, Gussenbauer—had assisted in the preparatory studies for those intestinal operations, particularly by way of resection, with which the name of Billroth will always be associated. Billroth himself has put on record his appreciation of Czerny's work—work since extended and so happily reduced to practice as to have brought that surgeon's name and services into the highest repute throughout Central Germany. When proposed as a candidate for Billroth's chair, it is no secret that Czerny at first held back, and the interpretations put upon this attitude were many—the claims of a lucrative practice being one. But the motive for it is now known and will make Czerny more popular than ever with the admirers and pupils of Billroth and with all interested in the Vienna School. He made it a *conditio sine quâ non* of his succeeding to the chair that the project nearest to his predecessor's heart should be carried out. This was neither more nor less than the reconstruction of the clinique of Surgery, involving the removal of many local drawbacks, chiefly architectural, against which Billroth with all his energy and authority had long agitated in vain. This condition, so peremptorily insisted on, was complied with; Czerny became a candidate, and the result has been hailed with enthusiasm throughout the medical world of Germany. The reconstruction will be proceeded with *quam primum;* the Allgemeines Krankenhaus will be extended by the demolition of the Alser-Caserne, and a series of new buildings for medical and clinical institutions will rise on the site. One of these is destined for the surgical clinique, and the planning of the structure has been committed to the architect Hofrath Franz Ritter von Gruber. Its completion will realise one of the most cherished objects of Billroth's life, and room will be found in the building for the pathological *matériel* accumulated by himself and his pupils for those additions to operative surgery of which the initiative taken by himself was so ably followed up by Czerny and others. It will, indeed, be a "Billroth monument"—such as the master himself would have been most gratified at seeing. The whole episode above described affords signal proof of the happy spirit in which the science and art of healing is cultivated in Germany, forming as it does an effective counterpart to von Pettenkofer's noble self-abnegation in behalf of State medicine. When asked by the civic authorities of Munich how they could best reward him for his hygienic rehabilitation of the Bavarian capital, "Build a sanitary institute," was the reply. Long may the Fatherland continue to produce such truly patriotic sons.

INJURY TO THE CAUDA EQUINA.

AN exceedingly interesting case of this character is published by Dr. Gordinier in the *Philadelphia Medical News* of April 14th. The patient was a man aged forty-one, who, while under the influence of alcohol, fell from an electric car on April 16th, 1891. He was struck on the lower part of the spine and was found to be unconscious immediately after the accident. On his way home, however, he regained his senses and was found to have lost the use of his legs. On the following day there was incontinence of urine, and the passage of a catheter was not accompanied by any sensation. As regards the rectum, semi-solid or liquid fæces would pass uncontrolled, while mechanical measures were necessary to remove hard or solid pieces, and the efforts to do this excited no sensation in the rectum. There was great pain in the sacral region, occasionally passing down over the region of distribution of the sciatic nerves. When seen about two weeks after the accident he was found to be unable to move the lower extremities except to make slight abduction of one from the other. There was marked foot-drop and atrophy of all the muscles, especially below the knees, and more on the right side than the left. All the reflexes of the legs—patellar, plantar, and cremasteric—were absent, but the umbilical was present. The affected muscles—practically all muscles of both legs—gave no response to faradaism, and only slightly to galvanism at the positive pole. Sexual power was entirely lost. There was a peculiar and

interesting distribution of anæsthesia, a saddle-shaped area over the sacrum stretching down over each buttock on to the posterior aspect of the thighs. The perineum, most of the scrotum, and the skin of the penis near its root were involved in this anæsthesia. The backs of the calves and the soles of the feet were also anæsthetic, but there was one part—viz., that almost corresponding to the popliteal space — that was not affected. There was absolutely no perception of the passage of the catheter. The treatment consisted of small doses of iodide of potassium and the application of galvanism. The progress towards recovery was slow, but steady. At the end of five months the patient was able to walk with the aid of crutches, and could stand alone. The knee-jerks were now present and the introduction of the catheter was felt. He also knew when the rectum was full, but had no power over the sphincter; sensibility had returned except over the perineum and the lower part of the scrotum. A month later the catheter was felt naturally, and control over the process of micturition had been regained. The rectal sphincter had also regained almost its normal power, and sexual power was perfect. The writer regards this as a case of hæmorrhage inside the dura mater affecting the cauda equina. The fact that the symptoms showed themselves chiefly in the sphincters and the perineal region—for these were the last to recover—would certainly place the focus low in the spinal canal, and the hypothesis of a hæmorrhage in the region indicated is offered by the writer as a probable explanation of the condition; and in this view we venture to think most will agree.

THE BATHS OF BORMIO.

THE subalpine region of North Italy—perhaps, taking it all in all, the most beautiful district in the world—contains some noteworthy resorts. Lugano has much to recommend it, especially at that season during which so few sanatoria are satisfactory—viz, the transition from spring to summer. Monte Generoso is a charming summer resort, combining fine air with scenery of almost unparalleled magnificence. Gardone-Riviera, on the Lake of Garda, has a peculiarly sheltered position, and its climate is mild and comparatively uniform. The baths of Bormio, at the head of the upper Waltelline, and easily reached either from Como or from the Engadine, are worthy of more attention than they have usually received from our countrymen, both on account of the character of the waters and their climatic and scenic attractions. Bormio is near the southern exit of the great Helvio Pass, and its elevation above the sea level is 4300 feet. There are nine springs of a temperature varying from 93° to 105° F., and the output is reckoned at 1200 litres per minute. The chief constituents of the waters are sulphate of soda, sulphate of magnesia, sulphate of lime, and carbonate of lime, with small quantities of chloride of sodium, iron, and manganese. The Bormio waters are thus similar to some of the most famous and popular spas. Mud baths are also extensively used at Bormio, and the ingredients of the mud are found to be chiefly carbonate of lime, carbonate of magnesia, sulphate of lime, aluminates, sulphide of iron, and free sulphur. The diseases treated at Bormio are gout, rheumatism, cutaneous diseases, glandular enlargements, chronic enlargements of the liver and spleen, gastric catarrh, gravel, and certain diseases of women. The climate is favourable for invalids, being decidedly tonic without extreme variations of temperature. The maximum heat in summer is reckoned at 80°, the minimum at the same season 41°, and the mean 61°. In autumn the maximum is 73°, the minimum 18°, and the mean 43°. There is ample accommodation at the Bagni Vecchi and the Bagni Nuovi. The neighbourhood abounds in interesting scenery, some of the finest parts of the Alps being readily accessible. Bormio is most conveniently reached *viâ* Landeck and Mals, and thence by diligence over the Helvio Pass, or from Colico on Lake Como. If the latter route be chosen there is a railway journey of twenty-five and a half miles from Colico to Sondrio, and a diligence drive of forty-one miles, occupying ten hours, from Sondrio to Bormio. The Valtellina, in which Bormio is situated, has had a chequered history. It belonged to the Grisons down to 1797, then to Austria, and since 1859 it has been united to Italy. It is famous for its wine, which is wholesome and agreeable. The baths of Bormio were known to the Romans and are mentioned by Pliny.

MR. GLADSTONE'S HEALTH.

WE have received the following authoritative bulletin: "Mr. Gladstone's right eye was operated upon for cataract quite successfully this (Thursday) morning at half-past nine. The operation was performed by Mr. E. Nettleship, assisted by Mr. J. B. Lawford, in the presence of Dr. S. H. Habershon. Mr. Gladstone's health is well maintained." We trust that the illustrious patient will proceed rapidly to convalescence, and that the result of the operation may be in every way satisfactory.

THE SALTERS' COMPANY AND SCIENTIFIC RESEARCH.

THE Salters' Company have recently decided to render an important service to medical science. The company have established in connexion with the Medical School of St. Thomas's Hospital a Research Fellowship in Experimental Pharmacology of the annual value of £100. The Fellow elected, who may hold office for three years, will be required to devote himself to the study of the physiological action of drugs. A similar Research Fellowship in Chemistry has been endowed, in connexion with the Research Laboratory of the Pharmaceutical Society, in order to provide for investigations on the chemical side of pharmacology. Of the various departments of medical science pharmacology is that perhaps which has received least attention in this country, and it has long stood in need of encouragement. The Salters' Company are to be congratulated on the very satisfactory manner in which they have chosen to aid the advancement of medical science.

EFFICIENCY IN VACCINATION.

WE published a short article in our last issue which dealt with the extent to which inefficient vaccination is practised, and suggested a plan for overcoming this serious obstacle to preventive medicine. The writer, Dr. Yarrow, speaks of what he has knowledge; and many of our readers can confirm his statements from their own experience. The amount of cheap and useless vaccination that is being practised is, we believe, an increasing quantity, and it is most unfortunate that the phrase "successful vaccination" should be permitted to be used with such laxity. It is notorious that many parents prefer to take their children to places where they can be vaccinated in a perfunctory and ineffective way rather than to the public stations. They will pay a small fee to comply with the letter of the law and evade its intention. Much is always made by the opponents of vaccination of the spread of small-pox amongst "well-vaccinated" communities. We venture to assert that there is hardly a town in England the inhabitants of which can be said to be *well* vaccinated. It is true that the forms of successful vaccination have been filled up and registered, for returns show in many places a high percentage rate of children that have been "successfully vaccinated." These returns are delusive, and the tendency, as Dr. Yarrow points out, is for this state of things to continue. We look to the Royal Commission that has

been so long investigating the subject to suggest a remedy. Dr. Yarrow himself suggests one which seems feasible, and would, in his opinion, render compulsory clauses nugatory. We fear, however, that he is too sanguine in this respect, unless people generally can be imbued with the strong belief in the protective value of vaccination which gains in force the more the subject is studied.

METROPOLITAN HOSPITAL SUNDAY FUND.

WITH a view to promote the success of the collections to be made for the Metropolitan Hospital Sunday Fund on June 9th the Lord Mayor and the Lady Mayoress have issued invitations to an evening reception to be held at the Mansion House on Thursday, June 27th, when illustrations of hospital life and work in London will be exhibited and described by Mr. H. C. Burdett.

THE LATE PROFESSOR G. J. ROMANES.

PROFESSOR GEORGE J. ROMANES, F.R.S., the friend of Darwin and the founder of the Romanes Lectures, died suddenly at Oxford on Wednesday last, in his forty-sixth year. His investigations in biological science are well known, and his ready pen and clear lecturing have done much towards making the subject of evolution understanded of the people. Although associated with Oxford, London, and Edinburgh in his various professorships, he was a Cambridge man. He had been a Fellow of the Royal Society for nearly twenty years.

GOITRE IN FINLAND.

ACCORDING to Professor R. Sievers, who has communicated the result of his painstaking inquiries to a Finnish medical journal,[1] goitre has been known in certain parts of Finland for about fifty years, since which time it may be said to have been endemic on the north-western shore of Lake Ladoga, the only portion of the country that can be considered of an Alpine character. Sporadic cases, too, have from time to time occurred on the western shore of Lake Raijane, and in 1870 there was an epidemic of goitre in a girls' school at Serdobol, a teacher aged twenty-four and fifteen children being suddenly affected. No one else was attacked, though there was a boys' school close by. The recruiting statistics show that, during the ten years ending 1892, of 220,000 young men examined only 144, or 0·06 per cent., were rejected on account of goitre, more than half of these coming from the province of Vyborg, which includes the mountainous district already mentioned on the shores of Lake Ladoga. Professor Sievers has been unable to find any evidence of the existence of cretinism in Finland, and during the last year or two goitre appears to have become very rare.

THE MORTALITY OF CÆSAREAN SECTION.

WE published last week a short paper by Dr. Robert P. Harris of Philadelphia—to whose indefatigable industry in registering international statistics obstetricians must be much indebted—on the mortality of Cæsarean section in Great Britain during the last eight years; that is to say, since the improvements characterising the modern operation were generally adopted. He has collected a total of sixty operations, the mortality of which was 32 per cent. In the twenty-two operations belonging to London in this list the mortality was higher—viz., 40 per cent. Dr. Harris also gives the results in 100 Cæsarean sections performed in the United States since 1882. There were thirty-eight deaths in this series. During last year there were in America sixteen operations with four deaths. The results, therefore, both in America and Great Britain are not dissimilar, and go to show that in both countries Cæsarean section is still an operation attended with considerable danger. Dr. Harris further gives the results attending symphysiotomy, from which it appears that the mortality of Cæsarean section in America is more than twice that of symphysiotomy. Inasmuch as modern symphysiotomy is relatively a much newer operation than the modern Cæsarean section, some of the mortality of the former is no doubt due to the want of familiarity on the part of the operators with the technique of the operation. This also appears from the results of the later symphysiotomies in the United States, which, Dr. Harris tells us, show only a mortality of about 7 per cent. for symphysiotomy. Probably much of the reluctance to undertake this operation that prevails here is due to a fear that lameness or crippling of the patient may possibly follow. On this point it is important to observe that Dr. Harris says there has been very little of anything of the kind known to follow the forty-four symphysiotomies that have been performed in the United States. It would be well, however, if he would in some future communication state precisely as to each case what the result in this respect has been.

[1] Finska Läkaresällskapets Handlingar, p. 414, Sparr.

THE MEDICAL SOCIETY OF LONDON.

THE termination of the 121st session of this society was signalised, as is customary, by the giving of a conversazione and by the delivery of the annual oration. Dr. W. M. Ord, who ably filled the post of orator, took for his theme "A Doctor's Holiday," and he showed how the keen enjoyment of a vacation spent in the midst of country life could be enhanced by the timely application of botanical and geological knowledge. His address (which is published in full in another column) contains not only much that is scientific, but also much interesting matter gleaned from old works on herb-lore and early medicine. After the delivery of the oration the President, Sir William Dalby, received the guests, who were later amused by a variety sketch, and during the evening selections were performed by the Bijou Orchestra.

THE DIFFUSION OF SMALL-POX.

THE number of cases of small-pox newly arising in London last week showed a decrease on the figures of the preceding week, having been 32 against 53. Three deaths were registered, and there were 200 patients under treatment in the Metropolitan Asylums Board institutions at the end of the week, in addition to 19 in the Highgate Small-pox Hospital, making a total of 219. The admissions in the week numbered 52, a fall of nearly 20. There were 3 deaths at West Ham, where 27 fresh attacks were recorded. There were also 3 deaths in Birmingham, and 38 newly recorded cases, whilst Smethwick had 11 new cases, and Willenhall very many more. Active measures are in operation in Hinckley for combating the prevalence of small-pox from which the town has been suffering. Manchester had only 2 fresh cases and the same number of small-pox deaths. One death was registered at Oldham, and 7 new cases at Bradford. Many other towns had the disease in smaller amount.

THE GERMICIDAL POWERS OF BLOOD SERUM.

THE experiments detailed in the paper by Dr. C. B. Ewing which appeared in the last issue of THE LANCET, form a distinct contribution to the subject of immunity in infectious diseases. These experiments, made with rattlesnake poison, were undertaken to determine the cause of the profound blood changes and rapid putrefaction of the body that occur after rattlesnake bite. It was argued that this might be due to the blood serum losing its bactericidal power, and the experiments were conducted with the view to test this hypothesis. The results recorded are certainly very startling; the comparison of the effects of normal serum and venom serum showing clearly that the

introduction of the venom speedily affects the germicidal powers of the blood. This germicidal property of normal serum is, however, itself limited, at least as regards the bacillus coli communis. The experiments with the bacillus anthracis seem to show that after a time the germicidal power is regained by serum that has been acted on by the venom. How the venom operates is not shown, but from the lucid account given by Dr. Ewing we may infer that it acts partly by reducing the alkalinity of the blood, an increase of which is known to raise the germicidal power, and partly perhaps by the direct influence of the toxic principle. In any case the results seem to confirm the views that normal healthy blood serum is a powerful protective agency against the inroads of bacterial infection, and that toxines act harmfully not merely by their direct effect, but equally, if not more fully, by lowering this resistant power of the blood against secondary infections.

THE DEATH OF DR. TWINING.

THE sad death of Dr. Alfred Hughes Twining of Salcombe once more illustrates the evil consequences which may attend practical joking. The deceased gentleman, whilst driving at night along a country road, was the victim of a foolish local custom, which prevails among the inhabitants of the district on May Day, of "ducking" each other with water. Two boys, together with others, were keeping up the custom, when the carriage in which Dr. Twining was returning home happened to pass, and the boys, it is alleged, threw water over the horse, causing the animal to bolt, with the result that the vehicle was overturned and the occupants were thrown violently to the ground. Dr. Twining was taken to the South Devon and Cornwall Hospital, where he was found to be suffering from dislocation of the left ankle and a fractured leg. On Saturday, May 5th, five days after the accident, it was found necessary to amputate from the thigh, and the operation was performed on the following day, but the unfortunate gentleman never rallied from the shock and died the next day. It was pleaded on behalf of the boys at the inquest that the water was thrown with no malicious intention and that the practice of "ducking" was a common one on May Day. The jury, however, returned a verdict of "manslaughter" against the two lads, and the coroner expressed the hope that the present case would be the means of stopping a very dangerous practice in the district.

OPHTHALMIA IN POOR-LAW SCHOOLS.

OPHTHALMIA among the children of our Poor-law schools is, from whatever point of view it may be regarded, a subject for serious consideration. It is a disease that is always more or less present, and is liable, under certain unhygienic conditions of living to which the children of the poor are so frequently exposed, to develop into outbreaks, with consequences to vision that are occasionally disastrous and almost invariably attended with ocular troubles that are distressing to witness in children and often difficult of cure. The great thing, of course, to be aimed at from a sanitary point of view is to prevent the occurrence of epidemic ophthalmia and to limit the spread of the disease when it does make its appearance; and, from a curative point of view, to treat the disease in its initial stage before any real damage has been done to the eye. An outbreak of ophthalmia often occurs more or less suddenly and provision has at once to be made for the removal or isolation of the affected children and for their accommodation, classification, and treatment. These are matters which cannot be properly accomplished in a hurry, and they frequently entail a considerable expenditure of money in providing temporary buildings, which may not be needed when the occasion for them has passed away. The history of the London District Schools at Hanwell may be cited by way of illustration. Of that history during the last fifteen or twenty years there is no need to speak, for our readers are already sufficiently familiar with it. Mr. Henry John Searle, chairman of the board of managers of the Central London School District, has recently put forward a practical proposal for dealing with the ophthalmia in pauper schools. He contends that just as the Metropolitan Asylums Board provides for the proper care and isolation of cases of infectious disease so there should be some adequate central establishment in connexion with the Poor-law school system for the treatment of children suffering from ophthalmia. He argues that the advantages of, and the saving by, such a plan would be very great. Children suffering from ophthalmia could be at once transferred to an establishment where they would be promptly and efficiently treated and provided for. In this way the risk of the spread of the disease and of its epidemic prevalence in school communities would be removed, and the great expense incurred at present by the multiplied provision of isolation departments at the various schools would be avoided. While we are not at all disposed to underrate the advantages of such a scheme, as set forth on paper, we think that it presents difficulties which will require to be very carefully thought out before it is practically adopted. The nature and extent of accommodation to be provided; the site of the proposed institution as regards airiness and salubrity and amount of acreage and its accessibility; the organisation necessary for the transfer of the affected children, and the working of the system generally, together with the estimated cost of the proposal: all these are matters that must be seriously taken into account, to say nothing of what might be the possible effect of aggregating a large number of children affected with ophthalmia in one and the same building.

FORTHCOMING EXHIBITION OF HYGIENE AT BOULOGNE.

AN International Exhibition of Hygiene will be held this summer at Boulogne-sur-Mer, the popular seaside resort, which has so often been qualified as the most English town out of England. Most of the sanitary reformers whose names we have had occasion to mention in connexion with sanitary work in France are assisting in preparing this exhibition. For instance, we find among these patrons the names of M. Henri Monod, Councillor of State and Director of the Sanitary Services of France; Dr. Brouardel, Dean of the Paris Faculty of Medicine; M. Pasteur; Dr. Proust, Inspector-General of the Sanitary Services; Dr. Napias; Dr. A. J. Martin; M. Émile Trélat, the eminent architect and authority on Ventilation; M. Bechmann, the engineer; and M. Louis Masson, the Sanitary Inspector of Paris. Dr. Aigre,[1] mayor of Boulogne, is the president of the Organising Committee, and he is assisted by the chief medical men, municipal councillors, engineers, and other local notabilities. The exhibition will last from July 15th to Sept. 15th and is to be inaugurated by the Minister of the Interior. From July 25th to 29th a Medical Hydrotherapic Congress will meet at Boulogne under the presidency of Professor Verneuil, of the Institute, and Dr. Bergeron, perpetual secretary of the Academy of Medicine. The exhibition will be built immediately behind the Casino, on the Quai Gambetta, where the old custom-house used to be. It will be divided into five groups. The first group, Domestic Hygiene, has three classes. The first class embraces the question of the housing of the poor, the supply and sterilisation of water, domestic drainage, the abolition of the smoke nuisance, heating and ventilating, &c.; the second class deals with food-supply and storage. The first class of the second

[1] See THE LANCET, March 18th, 1893, for an account of Dr. Aigre's action during the cholera epidemic at Portal and Boulogne.

group, Public Hygiene, deals with urban sanitation, sewers, wells, reservoirs, public washhouses, cesspools, treatment of sewage, scavenging, markets, slaughterhouses, stables, municipal statistics, &c.; the second class includes all that concerns the relief of the poor and help to the wounded. The third group is devoted to School Hygiene, and the fourth group to Maritime Hygiene, notably the clothing and food of the sailor and improved sanitation for fishing smacks. The fifth group comprises all that concerns Hydrotherapy. Persons desiring to exhibit should apply to M. H. Réveillez, Secretary to the Organising Committee, at the Hôtel-de-Ville, before May 25th. Doubtless this exhibition will add to the attractions of Boulogne, and we hope that it will enlighten the native population in matters relating to hygiene. In this respect there is still much to be learnt and much to be taught, for the drainage of Boulogne is very imperfect, and the inhabitants do not yet thoroughly understand how much their prosperity depends on the perfection of their sanitary ervices.

CADAVERIC RIGIDITY.

DR. TISSOT presented before the Académie des Sciences the results of his researches on cadaveric rigidity.[1] Two contrary opinions have been expressed by physiologists on this point, some concurring with Brücke and Kühne that the rigidity is due to a chemical phenomenon—coagulation of the myosine, whilst others, agreeing with Ingsten and Brown-Séquard, consider it as a final contraction of the muscles—that is to say, a physiological phenomenon. Dr. Tissot's conclusions are as follows: 1. The rigid muscles can very often be electrically excited for a variable length of time after the onset of rigidity and even when it is completely established. This persistence of excitability is almost constant in those cases in which rigor mortis has supervened rapidly. 2. The rigid muscles which have lost their electric excitability often preserve their mechanical excitability for a considerable period of time. 3 The rigid muscles which have lost their electrical and mechanical excitability can still be excited to contraction by chemical reagents. Contrary to what has been stated by several physiologists, the excitability of muscles to chemical reagents (chloroform, ammonia, ether, &c.) persists much longer than the mechanical excitability and is always the last to be lost. 4. Whilst the electrical excitability progressively diminishes, the excitability of the muscles to certain reagents increases and reaches its maximum when that of electricity disappears, and at the moment when the muscle becomes rigid. With some reagents, however, the reverse occurs and the excitability progressively diminishes. 5. Tetanised and fatigued muscles present an exaggeration of sensibility to chemical reagents in the same manner as the rigid muscles. This reaction has also been observed in muscles of which the vessels have been ligatured for some time, and in muscles which have been submitted to the action of air, heat, drying processes, &c. 6. Contraction produced in rigid muscle by the action of some excitant, even if it be only a small quantity of the vapours of chloroform or ammonia, is accompanied by the production of a "current of action" in the muscle. It is also accompanied by the disengagement of heat, as in the contraction of normal muscle. 7. Rigid muscles when exposed to the air absorb oxygen and give off carbonic acid. 8. Dr. Tissot had only twice been able to cause the onset of rigidity in the gastrocnemius of a frog by a single strong electric shock, just before the moment when the muscle would have lost its electric excitability.

WE understand that there is a probability of steps being taken to hold the annual meeting of the British Medical Association in 1895 in London.

[1] L'Union Médicale, April 28th, 1894.

AT the meeting of the delegates of the London medical schools held at the Middlesex Hospital on Wednesday last a resolution was passed expressing an approval of the general features of the scheme drawn up by the Gresham University Commissioners; but it was also resolved to ask that powers should be given to a Statutory Commission to reconsider and alter some important details in the report of the Commission.

MR JOHN CHARLES BUCKNILL, M.D., F.R.S., who is, we are pleased to learn, to receive the honour of knighthood, took an active part in the Volunteer movement and may be, indeed, regarded as its originator in this country. Dr. Bucknill, who is joint editor with Dr. Hack Tuke of the "Manual of Psychological Medicine," has written several works on allied subjects, and was Lumleian Lecturer at the College of Physicians in 1878.

THE testimonial to Dr. W. Howship Dickinson, which consists of a portrait of himself by the Hon. John Collier, a service of silver plate, and an illuminated address, will be presented to him on Monday, June 18th, in Grosvenor House. The Duke of Cambridge has, we understand, undertaken to present the testimonial to Dr. Dickinson.

THE new buildings of the Medical School of St. Thomas's Hospital will be opened by the President, H.R H. the Duke of Connaught, K.G., on Saturday, June 9th, at 4 P M.

THE NURSES' HOME AT THE LONDON FEVER HOSPITAL.

ON Friday afternoon last Lady Balfour of Burleigh, who was accompanied by her husband, the President of the Hospital, declared open a new Nurses' Home which has been recently built in juxtaposition to the London Fever Hospital. The total cost of the handsome annex, including the furnishing of it, was over £6000, and the money has been well spent, as this extra accommodation for nurses has been sorely wanted for a long time. This urgency of need for better accommodation for the nurses has led to the first step in future work. The erection of the Nurses' Home may

be taken as a first instalment of the work of general reconstruction. The architect of the Home was Mr. Keith Young, F R I.B.A. The building, an illustration of which we give, is a handsome and commodious three-storied house. It contains single bedrooms for thirty-one nurses, with certain large common rooms and other smaller ones, and its erection should greatly conduce to the comfort and general health of the nursing staff of the Fever Hospital.

THE LANCET

Special Analytical Sanitary Commission

ON THE

HERMITE PROCESS OF SEWAGE TREATMENT BY ELECTRICITY.

(THE RECENT EXPERIMENTS AT WORTHING)

CHEMICAL AND BACTERIOLOGICAL REPORTS.

THE proposal to treat sewage electrically was received a few years ago with considerable enthusiasm, and many experts ventured to think that electricity, which was doing so many wonders in other respects, would probably also give assistance in the direction of sanitary affairs, and perhaps afford a satisfactory solution of the problem of sewage disposal—if not, indeed, of sewage utilisation. But the first attempts to utilise the electric current as a sewage purifier met with little success, owing to the great practical difficulties that were encountered. We need not enumerate them here. Suffice it to say that of the electrical processes which count for anything now there are two which continue to excite considerable interest and curiosity amongst engineers and sanitary experts at the present time.

We refer to the Webster electrolysis process and the Hermite system of treating sewage with electrolysed sea water. In the former method the sewage is actually exposed to the action of the current, while in the Hermite method the sewage is submitted to the action of sea water, the composition of which has been partially altered by the action of electricity. Briefly, the Webster process consists in allowing ordinary sewage to flow through channels in which are placed iron plates or electrodes, set longitudinally, with the usual battery connexions with the positive and negative terminals of a dynamo. The sewage in its passage through these channels is said to become entirely split up by the action of the electric current upon the chlorides always present in sewage. At the positive pole the chlorine and oxygen given off combine with the iron to form a salt which is probably hypochlorite, and, at the same time, carbonate of iron is assumed to exist in solution, which not only deodorises the fæcal matter by removing sulphuretted hydrogen (FeS), but also acts as a carrier of oxygen from the air by being alternately reduced to ferrous and oxidised back to ferric oxide. The Webster process, therefore, although an electrical one, depends upon the production of certain chemical salts; but it is probable that the efficiency of the method depends largely, if not entirely, upon the fact that the sewage is presented to these chemical bodies while they are in a very active state—in fact, *in statu nascendi*. The Hermite method consists in the electrolysis of sea water, and the subsequent flushing of the contents of waterclosets with a definite quantity of the resultant fluid. The Hermite fluid is, therefore, a chemically active fluid, prepared by electrical means. The sewage is never in contact with the current, as in the Webster process, nor does the process pretend to secure the precipitation of organic matters. It claims, rather, to effect the complete deodorisation and sterilisation of sewer contents. Both processes, therefore, have one common object in view—namely, the healthy disposal, and not the utilisation, of sewage.

The Hermite process for the treatment of sewage, with which the present report proposes to deal, has been conducted on an experimental scale at Worthing during the early months of the year with the view of its adoption in accordance with the plan originated by M. Hermite. The prevalence of an unfortunate and disastrous enteric fever epidemic during the height of the season last year in Worthing led the council authorities to consider that some steps, apart from the obtaining of a new water-supply and the laying down of a new sewer system, were desirable in regard to the sanitary interests of the town. It was at this time that M. Hermite, a French chemist connected especially with the processes for the production of "bleach liquor" by electricity, was applying an electrolytic process to the treatment of sewage in certain seaport towns in France, in which "electrolysed" sea water was the distinctive feature. The town council eventually decided to give this process a trial, and an experimental plant was set up in Worthing and the experiments were carried on for several weeks, during which our commissioners have had ample opportunity, through the courtesy of the council authorities and the engineers in charge, to test the process and to form an opinion of its actual working powers.

The experimental plant erected in West-street, Worthing, consists of an engine and dynamo and electrolysers situated in one yard (A), which supply electrolysed sea water to an elevated tank from which the cottages on one side of West-street are constantly supplied. In addition to these there are two temporary waterclosets in Yard B which are in constant active use by the men engaged in the town constructing new sewers. The exit soil-pipes of the experimental closets in Yard B are provided at a short distance from the closets with an intercepting syphon, containing a screen or basket, which serves to intercept solid particles and thereby to leave them exposed to the disintegrating and dissolving action of successive flushes of the Hermite fluid. This device is held to be an essential feature in the Hermite system. There is a similar syphon in a third yard (C), which receives the overflow from the syphon in Yard B and also the ordinary sewage from fourteen cottages in West-street. During the greater part of the day, however, this syphon (Yard C) has passing through it household waste, soap water, &c., so that it may not contain electrolysed fluid at all; besides which, in wet weather it receives the storm water from the roofs of the cottages. In this small experiment, therefore, it would hardly be fair to regard this as a specimen of the efficacy of the Hermite process, because the discharge from the cottages would at intervals consist mainly of domestic waste, which would effectually sweep out all traces of electrolysed fluid derived from the two-gallon flushing-tanks of the waterclosets. The question at once arises whether, after all, this syphon would not represent the actual state of things in practice when the process is applied on a large scale. This point, it seems to us, could only be decided by actual trial, but it is not unreasonable to suppose, as the engineers assume, that the conditions of the effluent would vary in every house of the town. But, providing that the electrolysed fluid were of sufficient strength, the possible *minus* condition of the effluent of one house would be overcome by the excessive *plus* condition of another into which domestic waste found but little entrance. We must repeat that this is a question which only actual practice can settle; but it would then be no difficult thing to lay down conditions which required that the mixed effluent at the outfall should contain an excess of the electrolysed liquid. At any rate, this is one of those important points which has not been, but soon should be decided, and which we think cannot be cleared up by trials carried out on the plan and scale of the Worthing installation.

Before proceeding to give an outline of the experiments which have been selected for the purpose of this investigation we may append a short description of the machinery by which the "electrolysed" fluid is produced from sea water, together with a few particulars which, according to the inventor, are explanatory of its composition and action. The electrolysing plant at Worthing consists of two galvanised iron tanks, each of 1000 litres, or 220 gallons, capacity, between which is situated an electrolyser contained in a small metal reservoir. The electrolyser is made up of four rows of vertical rods, covered in their lower half by a mesh of fine platinum wire, which are immersed in the sea water. Between these rows, of which each contains eleven rods, are circular discs of zinc which revolve when the machinery is in motion. The current thus passes from the zinc to the platinum through the sea water and effects a decomposition or rearrangement of the molecules, so that the chloride of magnesium is split up into chlorine and magnesia. By the constant circulation of the sea water through the electrolyser, however, it is probable that by the union of magnesia (MgO) with chlorine (Cl_2) magnesium hypochlorite, $MgCl_2O_2$, is formed. Thus $2MgO + 2Cl_2 = MgCl_2 + MgCl_2O_2$. The chloride of sodium is not decomposed since there is an excess of magnesic chloride in the fluid, and magnesic chloride is far less stable than the corresponding sodium salt (NaCl), which, however, plays a not unimportant part in acting, as it is stated, as a conductor. Under normal conditions there should be produced, it is stated, one kilogramme of chlorine per hour per electrolyser, and this would give two cubic metres (2000 litres) of liquid,

containing 0·5 gramme Cl, or its equivalent, per litre per hour. M. Hermite states that he is able to guarantee a supply of one kilogramme of chlorine per hour per electrolyser for a motive power of 12-horse power, which would be equivalent to forty-eight cubic metres of the disinfectant in twenty-four hours at a strength of 0·5 gramme of chlorine per litre, or, if preferred or desirable, ninety-six cubic metres (96,000 litres) at 0·25 gramme per litre. The installation at Worthing is declared to be equal to producing one gramme of chlorine per ampère hour. The changes which take place on passing a current of electricity through saline solution are known to be complex, but the inventor is content to say that the disinfecting principle present in electrolysed sea water is an "oxygenated compound of chlorine." We shall see presently how far this statement is borne out by our own experiments.

The experiments about to be described relate to the chemical and bacteriological examination of the electrolysed fluid at varying strengths, and of the treated sewage effluents, and to the behaviour, chemical and bacteriological, of certain compounds of similar chemical composition.

CHEMICAL REPORT.

The Composition of Electrolysed Sea Water.

The analysis of electrolysed sea water (Hermite) gave the following results, and it is instructive to compare this analysis with that of untreated sea water from the same source.

Analysis 1.

Electrolysed sea water.*—Parts per 1000.

Calcium sulphate ($CaSO_4$)	1·392		
Magnesium sulphate ($MgSO_4$) ..	2·325	=	0·775 MgO
Magnesium chloride..	2·868	=	1·195 MgO
Sodium chloride	27·700		
Total solids	34·285	containing	1·970 MgO

* Oxidising value of liquid in terms of chlorine, 0·594.

Analysis 2.

Untreated sea water.—Parts per 1000.

Calcium sulphate ($CaSO_4$)	1·460		
Magnesium sulphate ($MgSO_4$) ..	2·300	=	0·765 MgO
Magnesium chloride	2·670	=	1·545
Sodium chloride	27·000		
Total solids	34·430	containing	2·31 MgO

A glance at the amounts of constituents in the two fluids will show at once that the only important difference between them is that a sensible loss of magnesia calculated as oxide has occurred in the electrolysed fluid. (To enable our readers to see this difference more clearly the quantities of MgO corresponding with the salts indicated have been calculated and placed to the right of the columns.) According to this analysis, therefore, there has been a loss of magnesia (MgO) in the electrolysed fluid equal to 2·31 *minus* 1·97, or 0·34 gramme MgO per litre. We need not at this stage offer any explanation of this important difference, but will refer to it again when the chemical behaviour of the fluid with certain reagents is under consideration. The reaction of electrolysed sea-water with litmus paper is difficult to ascertain, since instant bleaching of the colour takes place. It does not appear to affect it either way—that is to say, it is neutral. It possesses a clean-smelling, sweetish odour, which is quite distinct from chlorine. It instantly destroys the disagreeable smell of sulphuretted hydrogen, readily displaces the iodine in potassium iodide, and oxidises the lower metallic oxides into the higher. It retains its oxidising properties for a considerable time, but a gradual diminution in strength takes place, as is illustrated in the following results obtained at varying times with the same sample :—

Analysis 3.

Original strength equal to ..	0·60	gramme Cl per litre
Next day	0·594	,, ,,
Eight days	0·523	,, ,,
Twelve days	0·501	,, ,,

The sample referred to above was kept in an ordinary stoppered Winchester quart bottle, but the same sample stored in a carboy of ten gallons capacity showed at the end of twelve days a strength of 0·459 gramme Cl per litre. It is well to point out in this connexion that in the event of the system being applied to the needs of a large town the electrolysed fluid need not be stored, because the yield of liquor could be adjusted exactly to meet the daily demand, so that loss from storage would be obviated. The loss, however, in a few days appears to be small. It is not to be expected that the Hermite fluid, considering its nature, is without action upon metals; in a slight degree it attacks pure clean iron and zinc, but the action ceases sooner than we should be led to expect. A deposit forms in the lining of the supply pipes and on the walls of and in considerable quantities on the floor of the electrolyser, which effectually checks further action. It consists chiefly of magnesia contaminated with varying quantities of chloride and hypochlorite, as is indicated below :—

Analysis 4.

MgO	58·47 per cent.
Cl as hypochlorite	1·50 ,, ,,

It is, therefore, probably impure hydrated oxide of magnesium. It contains no zinc, but small quantities of iron. The effect, however, upon galvanised iron, the material of the tanks, must in any case be small, since large quantities of Hermite fluid evaporated down contained no zinc and only small quantities of iron. This result is hardly surprising when we consider that iron tanks are largely used to store strong "bleach liquor" in chlorine-producing works. Electrolysed sea water, however, exerts an important action on leather and rubber; it hardens these materials, because probably it oxidises them, and has, therefore, a tendency to render them useless for the purpose of washers in the valves and taps of fittings. This is a drawback to the scheme of general supply, and one for which it is difficult to suggest a remedy. Stable as Hermite fluid of good strength by itself is, it undergoes rapid diminution in chlorine strength when diluted with sea water. Thus mixtures of plain sea water and electrolysed water of known strength (0·728 Cl) were prepared, and the solutions tested at intervals, with the following results :—

Analysis 5.

No.	——	Original strength of mixture.	Strength after fifteen minutes.	Strength after twenty-four hours.	Strength after forty-eight hours.
1	Sea water, 1 part; Hermite fluid, 3 parts	0·546	0·49	0·35	0·33
2	Sea water, 3 parts; Hermite fluid, 1 part	0·181	0·155	0·035	0·02
3	Sea water, 1 part; Hermite fluid, 1 part	0·364	0·297	0·07	0·02
4	Tap water, 1 part; Hermite fluid, 1 part	0·364	0·353	0·350	0·348
5	Distilled water, 1 part; Hermite fluid, 1 part	0·364	0·355	0·353	0·348

As will be seen in the above table, similar experiments (4 and 5) were made by mixing electrolysed sea water with distilled water and with tap water. In both cases, however, the mixtures proved to be practically stable. What, then, becomes of the active chlorinated compound of electrolysed sea water when it is mixed with ordinary sea water? The answer is probably that the electrolysed fluid is rapidly reduced by the organic life and matter which are the constant constituents of sea water. The following experiment lends some support to this view. It was found that when Hermite solution was mixed with artificial sea water, made up by dissolving 27 grammes of common salt and 4 grammes of magnesic chloride in a litre of water, it remained practically as stable as the mixtures containing electrolysed sea water and distilled or tap water :—

Analysis 6.

	Original strength of mixture.	After 24 hours.
Artificial sea water, 1 .. Hermite fluid, 1	0·36	0·34

There are two important deductions to be drawn from the interesting results of these experiments—viz., firstly, that, although Hermite fluid may be diluted, without losing strength, with tap water, yet sea water could never be used as a diluent, since it rapidly reduces the strength of the solution; and, secondly, that a considerable part of the energy spent in the electrolysis of sea water must first be appropriated by certain constituents (probably organic) which exist in fresh sea water. Further, electrolysed sea water increases in stability in proportion to its strength, and *vice versâ*; solutions below 0·25 Cl per litre rapidly lose oxidising power.

We may next pass on to consider the chemical behaviour of electrolysed sea water when brought into contact with

various reagents and with certain organic materials. The oxidising equivalent of bleaching powder is usually ascertained by its action upon arsenious acid in alkaline solution, which is converted into arsenic acid. In practice a known excess of arsenious acid, or a solution of the acid in potassium bicarbonate, is added to a measured quantity of bleach liquor, or, in the present case, electrolysed sea water, and the excess of arsenious acid is determined by running in standard iodine solution. For convenience the result is recorded usually in terms of chlorine, although oxygen effects part of the change. Another method consists in adding potassium iodide to the bleaching liquid and measuring the liberated iodine by means of a standard solution of sodium thiosulphate. Now in the case of electrolysed sea water the quantity of oxidising chlorine found by the latter method (thiosulphate and KI) invariably exceeds that by the arsenious acid method. Under certain experimental conditions there are present probably, therefore, in the Hermite solution oxygenated compounds of chlorine of varying degrees of oxidising power.[1] The results are still more interesting when the oxidising power of the electrolysed sea water is ascertained by thiosulphate, first in neutral solution, and finally in the residual liquid after the addition of acid; they appear as follows with two specimens of Hermite fluid of varying strength:—

Analysis 7.

—	Strength according to arsenious acid method.	Strength according to thiosulphate method.		
		Neutral.	Acid.	Total by thiosulphate.
1. Electrolysed sea water	0·73 Cl	0·49	0·50	0·90
2. „ „	0·59 Cl	0·27	0·34	0·61

On distilling the electrolysed sea water with dilute sulphuric acid, chlorine is evolved, and this, on being measured, amounted to 0·94 grm. from a solution the original oxidising power of which according to arsenious acid was equal to 0·43 grm. Cl, or less than half the amount. This is precisely what happens when hypochlorite compounds are similarly dealt with in the presence of chlorides, the hydrochloric acid liberated by the action of sulphuric acid (H_2SO_4) on the chlorides present yielding half the total chlorine, and the hypochlorous acid the other half; thus, $HCl + HClO = H_2O + Cl_2$.

The action of electrolysed sea water upon urine is very instructive and is fairly illustrated in the following experiments. For this purpose urine containing 4·18 per cent. solids was diluted one-fiftieth, varying quantities of this diluted fluid were added to 50 c.c. electrolysed sea water of uniform strength (0·46 grm. Cl per litre), and after a time the fluids were tested to determine the final chlorine strength. The results are as follows:—

Analysis 8.

	Resid. Cl.	
	15 m.	24 h.
50 c.c. electrolysed sea water + 1 c.c. dilute urine ..	0·42 ..	0·38
„ „ „ + 5 „ „ ..	0·32 ..	0·24
„ „ „ + 10 „ „ ..	0·24 ..	0·09
„ „ „ + 100 „ „ ..	0·24 ..	—
„ „ „ + 120 „ „ ..	0·24 ..	—
„ „ „ + 130 „ „ ..	0·24 ..	—
„ „ „ + 140 „ „ ..	0·24 ..	—
„ „ „ + 150 „ „ ..	0·24 ..	—
„ „ „ + 200 „ „ ..	0·24 ..	—
„ „ „ + 300 „ „ ..	0·24 ..	—

It will be seen that the addition of comparatively large quantities of urine made no difference in the amount of the residual chlorine in the liquid; thus the 10 c.c. mixture contained the same quantity of residual chlorine as the 300 c.c. mixture. In other words, the electrolysed sea water is seen to lose a constant proportion of its oxidising constituent (almost exactly a half in terms of chlorine), no matter how excessive may be the quantity of urine. The same thing was found to take place with the broth used for cultures and with solutions of gelatine—that is, the chlorine was reduced to about one-half of the total present in the original electrolysed fluid in the time indicated. It should be added that the liquid a few minutes after it has been treated with urine in the manner just described slowly assumes a yellowish colour and develops a powerful chlorous odour, which is quite unlike the smell of unaltered electrolysed sea water. On gently warming, however, the smell disappears and the liquid is found to exhibit no longer any oxidising power. It occurred to us that this smell might be due to the liberation of chlorine or some other oxidiser, and this idea was so far confirmed by the result of the following experiment. On shaking the liquid with chloroform for a time and then washing the separated chloroform several times with distilled water it was found to liberate very readily the iodine in potassic iodide. The chloroform in a similar experiment, but conducted with the electrolysed sea water and with the prepared hypochlorous acid, yielded practically no iodine when potassic iodide was added. The experiment repeated with the broth and gelatine solutions also yielded an oxidising body to chloroform. Now, if this oxidising body is chlorine, and free chlorine, like its analogues iodine and bromine, is freely soluble in chloroform, then the action of the Hermite fluid upon organic matter, of which urine may be taken as a type, may be ascribed to hypochlorous acid, HClO, or its anhydride, Cl_2O, which may be regarded to break up simply into oxygen and free chlorine. The oxygen, uniting with readily oxidisable bodies, sets free the chlorine, which is left behind, so to speak, to act as a deodorant and antiseptic. In other words, electrolysed sea water, by the act of yielding up its oxygen to organic matter, becomes simply chlorine water, which in its turn, as is shown in the above experiments, is appropriated, though less rapidly, as an oxidiser. (Compare also footnote [2] on the following page.) Somewhat analogous is the action of alkaline hypobromite upon urea, which, as is well known, becomes reduced in the following manner, the urea yielding all its nitrogen in the gaseous state, while of course the CO_2 is absorbed by the excess of alkali: $CON_2H_4 + 3NaBrO = CO_2 + N_2 + H_2O + 3NaBr$. While, however, this example illustrates the action of hypobromite or hypochlorite in yielding up its atom of oxygen, it does not attribute any action to bromine or chlorine, since these are left combined with sodium, which is not surprising in a strongly alkaline fluid. In the Hermite fluid, however, we have not to deal with an alkaline fluid; indeed, we have obtained some evidence which serves to show that the active body in it is not magnesium hypochlorite in important quantity, as some have supposed, but hypochlorous acid itself. We may refer once more to Analysis 1 of electrolysed water given on the previous page, where it is contrasted with untreated sea water. As is there pointed out, the chief difference to be noticed between the two analyses consists in an important diminution of the total magnesia (MgO). Now a substance is deposited in notable quantities in the electrolysing tanks and along the pipes conveying the fluid to the service cisterns which proves on examination (Analysis 4) to consist of impure magnesia. This would at once explain the difference. Whatever change takes place on electrolysis there is evidently a subsequent dissociation of a magnesium compound, and the probability is that this compound is magnesium hypochlorite, for it is magnesium chloride that is decomposed by the current into chlorine and magnesia, and these probably reunite on circulation, forming hypochlorite in accordance with the equation $2MgO + 2Cl_2 = MgCl_2 + MgCl_2O_2$.

What is the nature of the dissociation? Is it not probable that magnesium hypochlorite—or, at any rate, part of it—breaks down with a molecule of water into magnesic hydrate or oxide and hypochlorous acid in accordance with the following equation: $MgCl_2O_2 + H_2O = MgO + 2HClO$? We may now quote some experiments which lend distinct support to this view—that is, that hypochlorous acid is chiefly the active agent of the Hermite fluid, and not magnesium hypochlorite, which, however, is probably present in small quantities. If a solution of good bleaching powder, which is composed of hypochlorite and chloride of calcium, be examined and its properties compared with electrolysed sea water, it will be found to exhibit some important differences—indeed, in many respects a solution of bleaching powder of the same chlorine strength is not at all comparable with the Hermite solution. In the first place, it is distinctly alkaline to litmus and exerts but a feeble and slow bleaching effect upon the paper, whereas electrolysed sea water is neutral to litmus paper, which it instantly bleaches a pure white; and in the second place bleaching powder solution yields a considerable precipitate when saturated with CO_2 and boiled, whereas the Hermite fluid yields a mere opalescence under the same circumstances. It is well known

[1] The solution contains small quantities of chlorate and probably also traces of other oxy-compounds of chlorine, which may break down into lower compounds. This would appear also from the fact that the fluid up to 0·5 strength is unstable, but above that point becomes stable.

that hypochlorous acid is a very weak acid and is readily displaced by carbonic acid from the hypochlorites, carbonates being formed. It may be urged that the formation of a precipitate of magnesium carbonate may be prevented by the presence of salt; but this is not so according to an experiment made with a solution of magnesium hypochlorite containing salt in the same proportion. *When, however, a solution of bleaching powder is prepared which, in regard to its chlorine value, is the same as the Hermite fluid, and after an excess of CO_2 gas has been blown through it, then the chemical properties of the clear liquid so obtained exhibit a very close resemblance to electrolysed sea water.* It is indifferent to litmus as regards acid or alkaline reaction, but bleaches it a pure white instantly and in precisely the same manner as the Hermite solution. This solution may be regarded as weak hypochlorous acid, obtained as represented in the following equation: $CaCl_2O_2 + CO_2 + H_2O = CaCO_3 + 2\,HClO$.

The table on the opposite page has been prepared to show the differences between ordinary bleaching powder solution and electrolysed sea water, and the close resemblance that exists between the Hermite solution and a solution of bleaching powder in which the calcium hypochlorite has been replaced by hypochlorous acid by the action of CO_2. It will be noticed that electrolysed sea water, and with it a solution of hypochlorous acid of approximately the same strength, exhibit certain important properties in common which sharply distinguish them from ordinary solutions of bleaching powder. Thus, on the one hand, bleaching powder solution is alkaline and bleaches but slowly; on the other, electrolysed sea water and hypochlorous acid are apparently indifferent to test paper, but bleach instantly and rapidly; and, while bleaching powder is very slowly reduced in strength in contact with ordinary printed paper—e.g., a newspaper—electrolysed sea water is almost immediately reduced to nearly half-strength, as is also weak hypochlorous acid. Pure paper is slowly oxidised by the Hermite liquid and by hypochlorous acid; bleaching powder solution has no appreciable action in twenty-four hours. With urine bleaching powder is almost entirely reduced as regards available chlorine, while electrolysed sea water and hypochlorous acid yield up in the same time almost exactly a half of their chlorine. Bleaching powder solution when diluted with sea water suffers little diminution of strength; the chlorine value of electrolysed sea water, or Hermite fluid, on the contrary, dwindles down to *nil* in a comparatively short time. The liquid obtained on distilling bleaching powder has no bleaching property, as have both the distillates from the Hermite fluid and weak hypochlorous acid. Finally, bleaching powder does not rapidly blacken metallic mercury, but electrolysed sea water and hypochlorous acid blacken it instantly. The action, however, of sulphuric acid upon all three liquids is the same—i.e., they yield chlorine in amount equal to twice that present in the original solutions. We may assume, therefore, that the reaction in the one case giving equivalent quantities is $2HCl + 2HClO = 2H_2O + 2Cl_2$ (the HCl being derived from the action of H_2SO_4 upon $NaCl = NaHSO_4 + HCl$); and in the other $CaCl_2O_2 + 4HCl = CaCl_2 + 2Cl_2 + 2H_2O$, one half of the chlorine yielded being obtained from the hypochlorous radical, and the other half from the liberated hydrochloric acid.

One point of difference in particular between the action of bleaching powder and electrolysed sea water (hypochlorous acid, as the table shows, being identical with the latter) is worthy of special remark. We refer to the action of these liquids on urine. Thus, practically all the available chlorine of bleaching powder is appropriated by the constituents of urine in fifteen minutes, while only one-half of the total available chlorine of Hermite solution (or hypochlorous acid) is absorbed in the same time. As the strength of the bleaching fluid might be supposed to exert some influence on this result, a weaker solution of bleaching powder was employed in a second experiment, but the results were substantially the same. The action of alkaline hypobromite of sodium on urea has already been adverted to, and it may be fairly supposed that the action of hypochlorite of calcium (bleaching powder which is alkaline) is similar; thus: $3CaCl_2O_2 + 2N_2H_4CO = 2N_2 + 2CO_2 + 3CaCl_2 + 4H_2O$. That is, the hypochlorite simply reduced acts by giving up its oxygen and being reduced to chloride. But with free hypochlorous acid the change may not be quite the same, and if we assume that hypochlorous acid acts not only by giving up its oxygen but its chlorine as well, then we have an explanation of the difference of action we are discussing. Thus $6HClO + CON_2H_4 = CO_2 + N_2 + 3Cl_2 + 5H_2O$. In other words, Cl_2O (the anhydride of hypochlorous acid) splits up into equivalent quantities of chlorine and oxygen, and the latter *in statu nascendi* instantly combines with organic matter and leaves the molecule of chlorine (Cl_2) in solution to act as chlorine water and as an antiseptic deodorant. This view may not be correct, but it, at least, receives some support from the above experiments.[2] Moreover, chlorine acts slowly, since its action depends upon the oxygen which it liberates from water, probably in the nascent state, by combining with the hydrogen; thus $H_2O + Cl_2 = 2HCl + O$. This liberation of oxygen is greatly facilitated by the agency of light. A gradual disappearance of the chlorine might, therefore, be expected after the dissociation of the hypochlorous acid, an occurrence of which kind would appear to take place according to the above experiments.

This leads us to the consideration of the chemical character and condition of effluent (Yard B) obtained in the Hermite process, the chemical analysis of which gave the following results:—

Analysis 9.	Grains per gallon.
Total solid matter	2875·60
Total suspended matter	20·72
Consisting of organic matter	14·28
Consisting of inorganic matter	6·44
Free ammonia	0·84
Albuminoid ammonia	1·89
Total chlorine	1372·0
Organic carbon	46·06
Organic nitrogen	4·91
Ratio $\frac{C}{N}$	9·4

Excluding the chlorides introduced by the admixture of sea water with the excreta, the sample exhibits a composition analogous to normal sewage water, except perhaps for the excessive proportion of carbon, which is, of course, derived from paper. It was almost impossible to examine the clear fluid, so difficult was it to filter. The effluent contained on the day after its collection 0·0566 gramme per litre of free chlorine or its equivalent. A fortnight later it contained only 0·014 gramme of free chlorine. The gradual and subsequent absorption of chlorine is here again illustrated, and it may be added that chloroform extracted chlorine from the effluent or an analogous body (not yielded by the electrolysed sea water itself), which, as in the above experiments with urine, was found to set free the iodine from potassium iodide. The waterclosets had previously been used by forty persons and were in actual use by three persons at the time of taking the sample.

We have shown in the foregoing results that electrolysed sea water contains probably as its chief active constituent hypochlorous acid, resulting from the partial dissociation of magnesium hypochlorite, and that it is fairly stable under ordinary circumstances; that it is a powerful bleaching liquid, being superior in this respect to bleaching powder solution, but not to a solution of bleaching powder of equal chlorine value, in which the hypochlorous acid has been liberated by the addition of a weak acid (CO_2 or others, in weak solution); that it is also a powerful deodoriser, and that in all probability these properties are due to the united action of oxygen *in statu nascendi* and chlorine. These, in brief, are the chemical properties of electrolysed sea water, and it remains for us to consider what effect for good or for evil such a liquid of definite strength would have when mixed in a certain proportion with fæcal matter. It deodorises, but does not destroy or remove, organic matters, although there is little doubt that certain of them are partially changed, and most probably those which are more readily putrescible (*vide* the analysis of effluent). While these things are true and are so far satisfactory, there must also be certain drawbacks in the system which are likewise indicated in these experiments. Electrolysed sea water, for instance, is rapidly reduced in strength by common newspaper, and as this is an almost invariable accompaniment of human dejecta its presence in the sewer must seriously affect the activity of the liquid, even if it does not withdraw the active constituent entirely. Indeed the entire contents of a sewer rapidly appropriate the chlorine strength of the liquid. (Compare also in this regard the bacteriological experiments with stools, urine, culture, &c.) The same observation applies to soap or domestic waste, &c., which rapidly "kills" oxygenated chlorine compounds. Again, it can only be supposed that deodorisation, not to say sterilisation, is complete when

[2] It serves, at any rate, to explain the superiority of electrolysed sea water as a bleaching agent and antiseptic. But it might be pointed out that a similar action might be assigned to the other oxides of chlorine; thus Cl_2O_3 (the anhydride of chlorous acid, $HClO_2$) might be supposed to yield $Cl_2O + O_2$.

TABLE IN WHICH THE CHEMICAL PROPERTIES OF SOLUTIONS OF BLEACHING POWDER, ELECTROLYSED SEA WATER, AND HYPOCHLOROUS ACID ARE COMPARED.

Experiment.	Bleaching Powder Solution.	Electrolysed Sea Water (Hermite).	Solution of Hypochlorous Acid (prepared by passing CO_2 through solution of bleaching powder).
1. Reaction with test paper ..	Distinctly alkaline.	Indifferent.	Indifferent.
2. Effect on colouring matter.	Slow bleaching effect.	Instant bleaching.	Instant bleaching.
3. Effect on newspaper	Original strength = 1·10 Cl. After 15 minutes = 1·06 Cl. „ 24 hours = 0·90 Cl.	Original strength = 0·73 Cl. After 15 minutes = 0·49 Cl. „ 24 hours = 0·03 Cl. „ 48 hours = nil.	Original strength = 0·67 Cl. After 15 minutes = 0·35 Cl. „ 24 hours = 0·04 Cl. „ 48 „ = traces.
4. Effect on pure paper	Original strength = 1·10 Cl. After 15 minutes = 1·09 Cl. „ 24 hours = 1·00 Cl.	Original strength = 0·73 Cl. After 15 minutes = 0·69 Cl. „ 24 hours = 0·60 Cl. „ 48 hours = 0·46 Cl.	Original strength = 0·67 Cl. After 15 minutes = 0·63 Cl. „ 24 hours = 0·60 Cl. „ 48 „ = 0·48 Cl.
5. Effect when mixed with excess of diluted urine after fifteen minutes	Slight development of chlorine odour. Original strength of mixture = 1·10 Cl. Final strength = 0·18 Cl. (After 15 minutes).	Development of powerful chlorine smell. Original strength of mixture = 0·46 Cl. Final strength = 0·24 Cl. (After 15 minutes).	Development of powerful chlorine smell. Original strength of mixture = 0·67 Cl. Final strength = 0·34 Cl. (After 15 minutes).
6. Effect of dilution with— (*a*) Sea water.	Sea water 1 Bleaching powder sol. 1 = 1·10 Cl. After 24 hours = 1·06 Cl.	Sea water 1 / Hermite 1 = 0·364 Cl. — 24 hours = 0·07 Sea water 1 / Hermite 3 = 0·546 Cl. — 0·35 Sea water 3 / Hermite 1 = 0·180 Cl. — 0·03	Sea water 1 Hypochlorous acid 1 = 0·33 Cl. After 24 hours = 0·10 Cl.
(*b*) Artificial sea water (equal volumes) ..	Original strength of mixture = 0·56 Cl. After 24 hours = 0·54 Cl.	Original strength of mixture = 0·36 Cl. After 24 hours = 0·34 Cl.	Original strength of mixture = 0·33 Cl. After 24 hours = 0·33 Cl.
(*c*) Tap water (equal volumes)..	Original strength of mixture = 0·56 Cl. After 24 hours = 0·53 Cl.	Original strength of mixture = 0·36 Cl. After 24 hours = 0·35 Cl. „ 48 hours = 0·34 Cl.	Original strength of mixture = 0·33 Cl. After 24 hours = 0·33 Cl.
(*d*) Distilled water (equal volumes)..	Original strength of mixture = 0·56 Cl. After 24 hours = 0·54 Cl.	Original strength of mixture = 0·36 Cl. After 24 hours = 0·35 Cl. „ 48 hours = 0·34 Cl.	Original strength of mixture = 0·33 Cl. After 24 hours = 0·33 Cl.
7. Cl. strength according to— (1) As_2O_3 test (2) Thiosulphate + KI (acid and neutral).	As_2O_3 — Thiosulphate + KI 1·20 Cl. — Neutral. 0·056 Cl. — Acid. 1·10 Cl. — Total. 1·15 Cl.	As_2O_3 — Thiosulphate + KI 0·73 Cl. — Neutral. 0·40 Cl. — Acid. 0·50 Cl. — Total. 0·90 Cl.	As_2O_3 — Thiosulphate + KI 1·20 Cl. — Acid. 0·60 Cl. — Neutral. 0·80 Cl. — Total. 1·40 Cl.
8. Changes of Cl. strength in boiling according to— (1) As_2O_3 (2) Thiosulphate + KI (acid and neutral).	Original strength = 1·20 Cl. After boiling: As_2O_3 — Thiosulphate + KI (Neutral. 0·08 Cl. — Acid. 1·00 Cl.) — Total. 1·20 Cl. — 1·08 Cl.	Original strength = 0·73 Cl. After boiling: As_2O_3 — Thiosulphate + KI (Neutral. 0·30 Cl. — Acid. 0·29 Cl.) — Total. 0·51. — 0·59 Cl.	Original strength = 0·67 Cl. After boiling: As_2O_3 — Thiosulphate + KI (Neutral. 0·28 Cl. — Acid. 0·28 Cl.) — Total. 0·50 Cl. — 0·56 Cl.
9. Distilling in vacuo	Distillate no bleaching properties.	Distillate powerful bleaching action.	Distillate powerful bleaching action.
10. Distilling with sulphuric acid	Original strength = 1·2 Cl. Strength of distillate = 2·5 Cl.	Original strength = 0·43 Cl. Strength of distillate = 0·94 Cl.	Original strength = 0·67 Cl. Strength of distillate = 1·12 Cl.
11. Other reactions	No blackening of mercury.	Instant blackening of mercury.	Instant blackening of mercury.

the chlorinated body is in excess, and an effluent containing free chlorine or its equivalent is inadmissible to rivers. The expense, moreover, in inland towns would be greater, since it would be necessary either to carry sea water or to prepare it artificially. M. Hermite's proposal is to establish a producing centre in the towns and to supply the liquid through pipes into all the streets and houses much in the same way that water and gas are at present supplied. The adoption of such a scheme in any place would no doubt lead to a sanitary condition of things hitherto unreached, but many excellent advances could be made in the same direction, it should be remarked, if cost were not an item which so often bars the way. Apart, however, from such a scheme, there is no doubt that the production from sea water of a powerful bleaching agent and deodorant is an innovation which should afford very material aid to sanitary progress. Thus for many purposes the substitution of electrolysed sea water for other and more expensive agents in our seaside towns and villages would doubtless confer many advantages. It could be used, for example—with desirable effect, doubtless—to flush the headings of drains and sewers; it could be discharged into sewage outfalls; and, lastly, the system could be applied on a small scale for the sanitary treatment of hospitals, barracks, &c., by means of an automatic electrolyser worked from a central electric supply. It should be added that, except as regards what has already been published in our columns,[3] no particulars in regard to the actual cost of production have as yet been furnished by the originator of the main idea.

BACTERIOLOGICAL REPORT.

In order that the bacteriological investigation of sewage that has undergone M. Hermite's treatment may be readily followed, it may be well to reconsider for a moment the arrangements adopted at Worthing to illustrate the system. It will be remembered that the electrolysed fluid is distributed from the storage tanks to two sets of cisterns, each of which supplies a set of closets. One of these sets consists of two waterclosets which were specially erected for the purposes of experiment in what is termed Yard B, Yard A being that in which the dynamo, the electrolysing tanks, and the storage tanks are placed. These two waterclosets are used by a number of workmen in the employ of the Corporation. The days we were there the numbers using the waterclosets before we left at about three o'clock were forty or more, and the closets were in use several times whilst we were collecting specimens. Each of these waterclosets in Yard B is provided with a short hopper-basin and trap delivering into an open drain the floor of which is made of "half-pipes" carefully cemented. This drain opens directly into the syphon, the mixture of fæces, solutions, &c., falling into a drum, described below. The cistern in each closet discharges two gallons of the Hermite solution at each flush. The syphon—of a capacity of about twenty-eight gallons—which receives only the excrement and the flushing fluid from these two waterclosets, contains a perforated metal drum so fixed that the contents from the waterclosets must pass directly into it. It is so arranged that the solid matter kept back within it is constantly immersed in the fluid in the syphon, but only as this solid matter becomes disintegrated can it pass through the small perforations. Paper is similarly kept back, and only escapes into the syphon, and so on to the outlet, after it has undergone such a process of softening that it can be forced in small fragments through the perforations of the drum. It is evident, then, that the solid matter must be subjected (*a*) to the temporary action of its own flush of the Hermite solution at full strength from the cistern, and (*b*) to the more continuous action of the twenty-eight gallons of electrolysed fluid that has already been used, but which still remains in the syphon. This fluid, of course, must be much weaker than that which comes directly from the flushing tank with each fresh stool. It is evident, too, that for each two gallons poured into the syphon after it is once fully in action, two gallons of the partially used-up fluid will escape at the outlet, and thence into the sewer under normal conditions, but which in the experimental station passes into the syphon of Yard C. This is the arrangement recommended by M. Hermite for use in connexion with all waterclosets. Near to Yard B is a third yard (C), in which are a similar syphon and drum, which receive the discharge—(*a*) from the closets, (*b*) from the sinks, and (*c*) the storm-water from the roofs and yards, of fourteen cottages; it also receives (*d*) the discharge from the syphon in Yard B. This instalment may be described as the system working under the very worst possible conditions, as not only will the very large quantity of water passing into it from the sinks, roofs, and yards tend to dilute the Hermite fluid to a point below that at which it is claimed that it can have any action on the sewage, but the activity of the chlorine in the solution will be further neutralised by the "antichlor" soap and other materials which are constantly passing from the sinks of these fourteen cottages.

It is evident that in the one case (in Yard B) all the excreta must come directly in contact with a measured quantity of the Hermite fluid, whilst in the other (in Yard C) the amount of water passing from the sinks and from the yards and roofs of the houses in various states of the weather must render the amount and strength of the Hermite fluid a very variable quantity, so that the action of the solution on the excreta may in some cases be actually *nil*. The whole syphon in such cases may be filled with rain- or sink-water in the intervals between the discharge from the waterclosets, whilst the discharge of one or two quantities of the electrolysed fluid into the twenty-eight gallons of water remaining in the syphon could, of course, exert little or no action upon the solid material left in the perforated drum. Where this mixed system is to be carried out M. Hermite recommends that the electrolysed fluid should be laid on to the houses so that the sinks should be supplied with it, by which means it may be applied for domestic purposes of disinfection, the wash and other waste water receiving its due quota of Hermite solution. As regards the storm-water, it would appear to us that it should not, under any circumstances, pass through the syphon in which the process of disinfection is to be carried on.

It is contended by the engineers that the syphon in Yard B only should be regarded as a fair test of the process in actual operation, and they state that Yard C was arranged simply to receive the excess of electrolysed fluid not used directly in the two closets, and that it must, therefore, not be looked upon as being an example of the Hermite system, such as they would recommend for adoption.

In our experiments, therefore, we have laid special stress on the results obtained with fluids taken from Yard P, those from Yard C being taken merely as an example of what would happen if this mixed system were adopted in a partial fashion. This part of the plant, however, also supplies us with the opportunity of gaining most valuable information as regards the probable result of attempting to flush out the common sewers with Hermite solution, when, as in the above experiments, the electrolysed fluid would meet not merely with the sewage proper, but also with all the wash and storm water of the community, and would, in addition, only have an opportunity of acting in this weakened condition on the material for a very short space of time. Before reporting upon such a system of sewage sterilisation as that proposed by M. Hermite, it seemed desirable, as far as possible, to test the process bacteriologically from its commencement—the sea water from which the antiseptic solution is made—to the final process, the discharge of the effluent which passes from the outlet into the main drain.

We considered it absolutely essential that the bacteriological samples of the effluents should be taken personally and tested at once by means of gelatine plates, as in several of the published reports on the Hermite system the results recorded are open to very serious objection owing to the fact that the samples had been tested only after the lapse of considerable intervals of time. The time element, as will be seen in our experiments, exerts an all-important influence on the results obtained, as if the available chlorine is present in very small amount the organisms may be able to increase in number, whereas if the solution be stronger the antiseptic action continues to operate and their number is reduced. As, of course, no arrangements had been made for the carrying on of somewhat complicated bacteriological experiments, we had to work at very considerable disadvantage in a shed through which every breeze that blew could find its way and bring with it large quantities of dust, probably containing numerous micro-organisms from the neighbouring yards, stables, and road; this constituted a very serious source of outside contamination to our media during the processes of making plates and inoculating broths. In the case of the gelatine plates, the possible source of error involved in this danger of

[3] On the question of cost M. Hermite publicly stated in Worthing that to supply the inhabitants of that town with not merely enough water for the closets, but also for domestic use—to enable them to have, in fact, a disinfectant to use for washing floors, sick-chambers, and so on—would cost 1*s.* per head per annum of the population; that would mean about forty litres (nearly nine gallons) per head per day. But for closets only, leaving a margin for town purposes, it would cost about 6*d.* per head per year of the population.—THE LANCET, March 3rd, 1894.

contamination, was completely obviated by making a series of dilutions, such, for example, as 1 c.c., $\frac{1}{10}$ c.c., and $\frac{1}{100}$ c.c., and then making plates from them. As all of these dilutions and originals were equally subject to this contamination its influence could be easily eliminated by mere enumeration of the organisms present. In the later experiments Esmarch's plate tube method, in which the gelatine is distributed on the walls of the tube, was adopted—a procedure which reduced this source of error to a minimum. This plate-tube method we found exceedingly useful in another direction, inasmuch as the tube, when fitted with an indiarubber cap, could be retained for a long period in the incubator without any evaporation of the gelatine taking place, and it thus allowed slow-growing organisms, which had probably been partially devitalised by exposure to the Hermite solution, to make their appearance as macroscopic growths. As, however, in our previous experiments the $\frac{1}{1000}$th dilution plate from the effluent in Yard B had invariably remained sterile, or contained only fungi which could be readily recognised as air contaminations, this factor did not materially affect the accuracy of the results obtained. In the case of broth inoculations the danger of such error creeping in is perhaps greater, but by taking several samples—one of 1 c.c. and others of $\frac{1}{10}$ c.c.—this source of error is again practically eliminated. In making a bacteriological analysis of fluids and material which contain so powerful an antiseptic as the Hermite solution is maintained to be, it is obvious that our first object must be to ascertain precisely the influence which the addition of this fluid exerts on our normal cultivation media. It is plain that we must avoid adding not merely that quantity of the solution which would of itself kill the germs present, but also that much smaller quantity, which, when continuously present in the gelatine or broth would convert it into an unsuitable medium for organisms which have already been weakened by being subjected to the action of the strong solution. We append the following tables, which indicate the proportions of chlorine in which (the figures being calculated on the supposition that the medium acts merely as diluent and that no chemical changes intervene) the different organisms are inhibited or permitted to grow.

TABLE I.

Quantity of Hermite Solution required to be added to Gelatine to prevent the Growth of the following Micro-organisms.

Gramme of available chlorine in Hermite solution per litre.	Staphylococcus aureus.	Micrococcus prodigiosus.	Cholera.	Anthrax.	Mixture of organisms from stool.	Typhoid.	Diphtheria.
0·250	—	—	—	—	—	—	—
0·200	+	+	—	—	+	..	..
0·160	+	+	+	+	+	—	—
0·115	+	+	+	+	+	+*	+*
0·090	+	+	+	+	+	+*	+*
0·060	+	+	+	+	+	+*	+*

* Very small colonies were recognised by means of the microscope after a week's incubation.

TABLE II.

Quantity of Hermite Solution required to be added to Broth to prevent the Growth of the following Micro-organisms.

Gramme of available chlorine in Hermite solution per litre.	Potato bacillus.	Staphylococcus aureus.	Typhoid.	Micrococcus prodigiosus.	Cholera.	Diphtheria.	Anthrax.
0·250	+	..	—	—	—	—	—
0·200	+	..	—	—	—	—	—
0·160	+	..	—	—	—	—	—
0·134	+	..	—	—	—	—	—
0·115	+	+	+	—	—	—	—
0·090	+	+	+	—	—	—	—
0·030	+	+	+	+	—	—	—
0·047	+	+	+	+·	—	—	—
0·023	+	+	+	+	..	+	—
0·012	+	+	+	+	..	+	+

It will be seen from these tables that a much smaller proportion of the Hermite solution suffices to prevent the growth of organisms in broth than is required in the case of gelatine. It is, indeed, very probable that a great part of the available chlorine is used up by exerting its bleaching action on the gelatine. When added to even a small quantity of broth titration of the available chlorine demonstrated that one-half of the available chlorine immediately disappears. It would appear, indeed, that only one of the chlorine bodies present in the Hermite solution is used up by the broth, and other experiments with broth cultures and Hermite solution, as will be seen later, seem to indicate that either this chlorine is perhaps still available as an antiseptic or that the residual chlorine is rendered more effective as an antiseptic.

The proportion of Hermite solution necessary to inhibit the growth either in broth or gelatine, as will be seen from the above tables, is so great that it is highly improbable that even 1 c.c. from the distribution tank, and still less from the outlets, added to the usual quantities of broth or gelatine could in any case inhibit the growth. We must remember, however, that in these experiments the media were inoculated with innumerable organisms from a pure culture of which probably only a small proportion grew, whereas in our actual experiments on the system the number of organisms introduced would be very small. We tested this by inoculating a gelatine tube with 1 c.c. of a tap water from which were developed between twenty-five and thirty organisms, and another tube in which 0·160 available chlorine had been added, and it was found that only about one-third of the colonies developed, the non-liquefying organisms being especially checked. The same thing may be observed in our table, Typhoid and Diphtheria, the non-liquefying organisms being those specially affected. In this way may be explained the fact observed that our dilution plates occasionally exhibited a relatively larger number of colonies than might have been expected in comparison with the original plates.

It will be observed also that we occasionally obtained positive results in broth when no positive results were obtained in the gelatine plates; the growth obtained was usually that of the potato bacillus; this was due, no doubt, to the higher temperature at which the broth was kept, and the free entrance of oxygen to which the organism was there exposed to facilitate the germinating out of the potato bacillus spores.

Sea Water.

The sea water which was to undergo electrolysis was conveyed to Yard A in large metal tanks similar to those which are employed for street-watering purposes. From this water gelatine plates were made on two separate occasions. On the first occasion there were present from 30,000 to 40,000 micro-organisms per cubic centimetre; on the second occasion the number present was much less, being calculated as from 400 to 500 colonies per cubic centimetre. Such variations can, however, be easily explained, as, owing to the rapidity with which such organisms multiply in water, the time during which the water has been allowed to stand in the transport tank and the temperatures to which it has been exposed would readily explain much greater differences. We next determined roughly how many of these were spores, as these being much more resistant than organisms which have germinated out might possibly pass unharmed through the process of electrolysation and accordingly appear in the later stages of our examination. The method we employed was to subject the water to a temperature of 65° C. for half an hour, which is usually sufficient to destroy all but spore-bearing organisms. Tested in this manner the sea water on the two occasions mentioned indicated the presence of only two and five spores per cubic centimetre respectively.

Sea Water undergoing Electrolysation.

It would have been interesting to have watched the progressive diminution in the number of organisms originally present in the sea water as the fluid gradually gained in chlorine strength during the process of electrolysis. As, however, the electrolysing tanks are never emptied, about one-third of the solution being allowed to remain to be mixed with the fresh sea water, the solution is at once raised to a strength sufficient to kill most organisms. The samples taken, as a matter of fact, almost invariably remained sterile; only on two occasions were growths obtained in the broths inoculated, and in both cases these consisted of the common potato bacillus (Bacillus mesentericus vulgatus), the spores of which, as we shall see later, are very resistant. Although this organism is a very common impurity and almost ubiquitous, and might possibly have

only recently fallen into the fluid before the sample was taken, it is more probable that these spores, which are able to resist for a very long time the action of the Hermite solution, had really been exposed to its action from the beginning of the process. The gelatine plates, on the other hand, remained uniformly sterile. This apparent contradiction we were able afterwards to explain as being in all probability due to the fact that the spore or spores present, which were possibly partially devitalised, were unfavourably situated, perhaps by their position in the gelatine and also as regards the entrance of oxygen and the temperature to which they were exposed in the gelatine chamber, for in the later experiments, on several occasions, when we were operating with plate tubes which had been under observation for a week or ten days without result, these same tubes when liquefied and placed at a temperature of 37° C., in the course of a few days became turbid and gave evidence of the growth of micro-organisms.

Distribution Tank.

The Hermite solution which was being used to supply the cisterns of the waterclosets was examined on several occasions by adding different proportions to gelatine and broth, but only once was any positive result obtained, so that this may legitimately be regarded as accidental.

Effluents in Yard B.

The results obtained from the effluent of the waterclosets in Yard B are certainly the most important of any obtained in the whole investigation, as here we find the system working under the most favourable conditions. Should it fail, here, to give those results which are claimed for it there can be little doubt that under any other conditions the results would be still less satisfactory. The samples with which we worked were taken on three different days, and on the last two occasions the effluent was tested several times. The sewage which had passed through the process was collected in a sterilised glass tube or vessel, from which tubes of gelatine and broth were immediately inoculated in the shed in Yard A. Samples were also taken to our laboratory and again subjected to analysis after varying intervals of time.

The contents of both the drum and syphon (at outlet) of Yard B consisted of slightly turbid fluid, which exhaled a strong, sweetish, chlorous odour and was not in itself at all disagreeable; there was certainly an entire absence of the usual fæcal odour. The fluid, on being held up to the light, was seen to contain many small fragments of fæcal matter which had become bleached to a light grey colour. The temperature of the fluid effluent in the syphon varied from 12° to 13° C. The results obtained from this fluid effluent varied very considerably, even when the plates were made from the same sample; this can, however, be readily understood when we consider the comparatively small number of living organisms which were present and the probability of their very unequal distribution in the fluid. We have observed on several occasions when examining a colony under the microscope a small mass of foreign matter in its immediate neighbourhood, from which the colony apparently originated. In other cases where we could not trace this relationship it is very probable that these small particles had undergone disintegration owing to the action of the gelatine, the organism being thus set free. If the organisms from which growths are obtained in our gelatine and broth tubes were, as we suppose, those which had escaped the action of the Hermite solution owing to their having been enveloped in a coating of solid matter, it may be readily understood how the fluid would vary very much as regards its richness in living organisms. Where, as was usually the case out of several inoculations, some remained sterile, these are not recorded. Where a growth was also obtained which was not inconsistent with this in other tubes, inasmuch as a negative never excludes a positive result, it is recorded.

It may be mentioned here that the colonies frequently required a much longer time to become visible to the naked eye than is usually the case; this may have been due in part—(*a*) to the addition of the antiseptic fluid to the nutrient gelatine, (*b*) to the organisms having been weakened by the previous exposure to the action of the antiseptic, or (*c*) to the colony having developed from a spore, which, if embedded in the gelatine, might be unfavourably situated as regards its oxygen requirements in germinating out. When no colonies appeared in a week or ten days, in the case of an experiment that had been carried out in a plate tube, the gelatine was liquefied and placed at the temperature of the blood, and examined again after the lapse of a few days. By this means we were able in certain instances to obtain growth in tubes which had previously remained sterile. In these cases the organism almost invariably turned out to be the potato bacillus (bacillus mesentericus vulgatus). Under such circumstances, where the tubes of the lower dilutions treated in a similar fashion remained sterile, the inference as regards the presence of living organisms in the material tested may be quite legitimately drawn.

In Table III. we give briefly the outcome of our experiments with the contents of the syphon in Yard B.

TABLE III.

Yard B.—Bacteriological Examination.

Origin of sample and periods when examined.	Strength of distribution tank in gramme per litre.	Grammes of available chlorine in inlet or outlet per litre.	Number of colonies present per c.c. in gelatine plates.	Broth tubes.
Sample I.				
OUTLET (syphon):				
Immediate ..	0·926	0·126	6	Became cloudy.
5 hours	..	..	2	Showed no growth.
27 hours	..	0·070	Nil.	..
11 days	..	..	Nil.	Showed no growth.
Sample II.				
OUTLET (syphon):				
Immediate ..	0·926	0·148	1 (?)	Tubes of 1 c.c. and ½ c.c. showed no growth.
4½ hours	..	..	2	Showed no growth.
26½ hours	..	..	Nil.	Showed no growth.
11 days	..	0·070	Nil.	..
Sample III.				
OUTLET (syphon):				
Immediate ..	0·692	0·112	Nil.	Showed no growth.
7½ hours	..	..	3	Cloudy, with a wrinkled membrane. Inoculation on potato showed presence of potato bacillus.
30 hours	..	..	12	..
11 days	..	0·063	Nil.	..
Sample IV.				
INLET (drum):				
Immediate ..	0·540	..	1 (?)	Showed no growth.
OUTLET (syphon):				
Immediate ..	..	..	2	..
OUTLET (syphon):				
Immediately after being stirred up..	..	..	3	Showed no growth.
Sample V.				
INLET (drum):				
Immediate ..	0·50 to 0·60	..	20	Became cloudy.
OUTLET (syphon):				
Immediate ..	..	..	15	Became cloudy, with sediment.

These experiments seem to indicate quite clearly that the effluent cannot be considered as absolutely germ free, although their number has undoubtedly been reduced to such an extent that unless experiments were carried out with the greatest care the results might be frequently classed as falling within the limits of experimental error. The question now arises whether these organisms which had escaped the action of the Hermite solution might be not vegetative bacilli, but their more resistant spores. We have tested the samples in the laboratory by exposing gelatine tubes which had received 1 c.c. of the fluid at the time of the taking of the sample and then been allowed to solidify, and with broth tubes, to a temperature of 65° C. for half an hour or longer. Such tubes almost invariably remained sterile. It is not, however, possible from these experiments to draw with safety the conclusion, when the other tubes exhibited growth, that these could not have been present in the form of spores. In favour of the view that the growths frequently originated from spores may be urged the fact that the potato bacillus occurred the most frequently of all organisms, and, as is well

known, these form exceedingly resistant spores, which, as in our later experiments, are able to withstand for prolonged periods the action of any but the strongest solutions of the Hermite fluid. On the other hand, it must be mentioned that we have on several occasions met with other organisms, which, so far as we have been able to investigate them, appear to form no spores. We have never, however, obtained colonies of bacterium coli communis (the characteristic organism occurring in stools) from the samples taken in Yard B; this we regard as a fact of the utmost importance from a practical point of view, for if this organism is unable to escape the action of the Hermite solution it is exceedingly improbable that bacillus typhosus, or still less the bacillus of cholera or diphtheria, would be able to run the gauntlet. The necessity, indeed, of killing spore-bearing organisms in the case of sewage is not very obvious, as none of those disease germs with which we are wont to associate danger from sewage are recognised as being able to form spores.

Effluent in Yard C.

The effluent in Yard C is not, as we have already mentioned, in the opinion of the engineers, to be regarded as a fair test of the process when properly carried out. We have here a "mixed" system, where not merely the sewage proper but also the house and storm water are allowed to pass through the syphon, in addition to which the houses and sinks are not supplied with the Hermite solution, as is recommended under these circumstances by the originator of the system. It may, however, be doubted, even were the solution laid on to the houses and used for sink purposes, whether we could depend upon obtaining a comparatively sterile effluent. In the case of waterclosets we may usually rely upon each stool receiving its due quota of the Hermite fluid, but it would be quite another matter to have to depend upon the inmates of a household that the house water on each occasion should receive its due quantity of the antiseptic, a quantity that would vary under different circumstances and would require considerable judgment in its use, as, for example, when a small amount of soap had to be dealt with, which would require a quite inordinate quantity of the solution to keep up the strength in the syphon to the required standard.

TABLE IV.

Yard C.—Bacteriological Examination.

Origin of sample and periods when examined.	Strength of distribution tank in gramme of chlorine per litre.	Gramme of available chlorine in inlet or outlet per litre.	Number of colonies present per c.c. in gelatine plates.	Broth tubes.
Sample I.				
INLET (drum):				
Immediate ..	0·926	0·001	7,000 to 1,000	Became cloudy.
5 hours	..	..	200 to 300	Turbid, with wrinkled membrane; potato bacillus, with other organisms.
27 hours	..	..	4,000 to 5,000	—
OUTLET (syphon):				
Immediate ..	0·926	0·007	3,000 to 4,000	—
5 hours	..	..	40 to 50	Clear fluid, with wrinkled membrane; potato bacillus; also fungus.
27 hours	..	..	200 to 300	—
Sample II.				
INLET (drum):				
Immediate ..	0·092	0·0282	15,000 to 20,000	Became turbid.
8½ hours	..	..	60 to 80	Became cloudy.
31 hours	..	..	10 to 20	—
OUTLET (syphon):				
Immediate ..	0·092	0·007	2,000 to 3,000	Became cloudy, with wrinkled membrane.
8½ hours	..	..	20 to 30	Turbid, with wrinkled membrane; potato bacillus, with other organisms.
31 hours	..	..	30 to 40	—
Sample III.				
OUTLET (syphon):				
Immediate ..	0·500 to 0·000	..	150 to 200	Became cloudy.
Sample IV.				
INLET (drum):				
Immediate ..	0·540	—	800 to 1,000	Became turbid, with sediment.
OUTLET (syphon):				
Immediate ..	..	..	100 to 200	Became turbid, and wrinkled membrane formed, indicating presence of potato bacillus.
OUTLET (syphon):				
Immediate (after being stirred up).	..	..	5,000 to 6,000	—

In Table IV. the results of our experiments with the contents of the syphon in Yard C are detailed. The contents of the inlet (drum) and the outlet (syphon) both exhaled a slight but distinct chlorous odour, and as in the case of the syphon in Yard B no fæcal odour was to be recognised.

As will become evident on a mere glance at the table, we cannot speak in the case of this effluent of sterilisation, or even perhaps of a reduction in the number of the germs originally present. The explanation of this lies at once to hand when we see from the second column of the table to what an extent the chlorine strength had fallen. The amount, indeed, is such that one would suppose from the titration results it can practically exert no influence whatever on the germs present. In spite of this, however, it will be noticed that in the course of the first few hours in those samples that were tested a very considerable diminution had taken place. We have, however, been forced to the conclusion that titration of the Hermite solution when mixed with organic matter does not afford a true index of its antiseptic value.

Laboratory Experiments on Sterilisation of Stools.

Our first experiments in this connexion were naturally directed to determine how far the Hermite solution could be depended upon to disintegrate hard stools and whether the inner portion of such was sterilised. For these experiments small nodules of a hard stool weighing from two to three grammes were placed in glass jars and treated with from 200 to 300 c.c respectively of the Hermite solution of various strengths. The outer surface of the stool rapidly became bleached, presenting a dull, ashen grey appearance; at the same time this outer portion became friable and more easily broken down, so that under agitation it would no doubt have been cast off and have presented the thready, flaky fragments similar to those found in the effluent of Yard B. The Hermite solution did not appear to become rapidly exhausted, as after forty-eight hours it still retained its characteristic odour, whilst no objectionable fæcal smell was to be recognised. As was to be expected, the inoculations at the varying times in all cases gave one or more positive results, as will be seen from the following table.

TABLE V.

Antiseptic Action of Hermite Solution on Solid Stool, in the proportion of 100 c.c. of Fluid to 1 Gramme of Stool (Portions for Inoculation taken from Centre).

Gramme of available chlorine in Hermite solution per litre.	One hour.	Twenty-four hours.	Forty-eight hours.
0·70	+	+	+
0·50	+	+	+
0·25	+	+	+

In our next experiment a complete stool, consisting of both fæces and urine, was treated with that proportion of Hermite solution which is discharged at each flush. This was taken of varying strengths, in order that we might ascertain to what extent these were able to effect sterilisation. The stool experimented upon consisted of 140 grammes solid matter and 300 c.c. urine. We regard the presence of the urine as absolutely essential if we wish to represent the actual state of affairs, although it would appear that experimenters have usually left this factor out of account. We have every reason

to believe that it must exert an all-important influence on the course of the process, since the addition of a very small proportion of urine (1 in 20) to the Hermite solution gives rise to an immediate and so extensive chemical change in the composition of the fluid that now only one-half of the available chlorine which was previously present can be estimated by means of arsenious acid.

We have already seen from our experiments on the solid stool that the Hermite solution must come into close contact with the material operated upon if its antiseptic action is to be relied upon as effective within a reasonable space of time. The solid portion of the stool was accordingly mixed with the urine and broken down into a uniform paste. As each stool was to receive a flush of two gallons, we could now take a proportional quantity of the fluid stool and subject it to the action of its proper quota of Hermite solution. The results of these experiments are set forth in Table VI.

TABLE VI.

Antiseptic Action of Hermite Solution on Emulsion of Stool with Urine.

Gramme of available chlorine in Hermite solution per litre.	Time when tested.	Gramme of available chlorine in mixture per litre.	Average number of colonies present per c.c. in gelatine plates or growth in broth.
0·82	1 minute	0·324	150 colonies.
0·82	15 minutes	0·268	100 to 130 colonies
0·82	30 minutes	..	Broth + potato bacillus.
0·82	20 hours	..	12 colonies. No Bacterium coli commune.
0·53	1 minute	0·280	100 to 150 colonies.
0·53	15 minutes	..	80 to 100 colonies.
0·53	30 minutes	0·200	Broth + potato bacillus.
0·53	20 hours	..	150 colonies (many Bacterium coli commune like organisms).
0·25	1 minute	..	150 colonies.
0·25	15 minutes	0·126	150 to 200 colonies.
0·25	30 minutes	0·112	Broth + potato bacillus, with other organisms.
0·25	20 hours	..	300 colonies (many of which are Bacterium coli commune).

Control plate gave, on an average, over 1500 colonies per c.c.—almost all of the non liquefying Bacterium coli commune type.

These experiments would indicate that when a stool is treated in this manner a Hermite solution of between 0·7 and 0·8 gramme of chlorine per litre is necessary in order that the object desired may be attained as, in the case of both of the lower strengths employed, bacterium coli commune, which as a non-spore bearing organism provides one with an index of what would happen to such pathogenic organisms as typhoid, cholera, and diphtheria, were still present.

It will be observed that in the case of all the three strengths that were employed the results obtained in the first five minutes are, so far as we can judge, identical, inasmuch as in each the number of organisms originally present as calculated from the control has been reduced to one-tenth. This is probably to be ascribed to the fact that although the solid matter of the stool had been reduced to a uniform paste, so far as this was possible, a certain proportion of the organisms would still be embedded in small particles of organic matter, which would protect them from the immediate action of the antiseptic, which therefore could only come into play on them after the lapse of a certain period of time. If, however, at the period when these particles are breaking down under the action of the fluid, either as due to the peculiar properties of the fluid or to the mere action of the water, the strength of the Hermite solution had fallen below that point which is necessary for it to exert its antiseptic action, the organisms present would be recovered in our plate cultivations, and might even simulate the appearance of a true multiplication of the organisms, although this might not really have taken place, but would probably be due to groups of organisms which had previously given rise to only one colony being now broken up into individual members, or rather to these being now equably distributed throughout the fluid. Viewing the results in Table VI. from this point of view, and taking into account the estimated strength of the Hermite solution at different periods (for the probable strength at twenty-four hours, *vide* Table VII.), the following conclusions may be drawn: (1) that when Hermite solution of 0·8 gramme chlorine per litre was used the antiseptic action continued in operation throughout the twenty-four hours, and only the most resistant organisms survived its action; (2) that where a solution of 0·5 gramme was employed the available chlorine became exhausted before it had accomplished its work; (3) while in the case of the weakest solution, 0·25 gramme, it had become inert long before the completion of the breaking down of the particles of fæces.

It must, however, be borne in mind that these results are also capable of quite another explanation. It is well known that if we subject a pure culture of an organism to a gradual process of sterilisation we do not find any precise line where all the organisms are suddenly destroyed, but that for a certain period before the limit is attained a gradual and progressive diminution occurs, the weaker individuals being weeded out and the more resistant, which are able to withstand the injurious influence for a longer period, being left. We are, however, of opinion that these individual differences in the susceptibility of the organisms would not apply with sufficient force to our stool experiments to supply us, without the concurrence of other factors, with a sufficient explanation of what was observed in the case of the stool experiments.

As will be seen in the experiments in which we attempt to gauge the antiseptic value of the Hermite solution and compare it with other better-known substances which are used for similar purposes, we found that bleaching powder solution exerted a very similar action, especially when the hypochlorous and chlorous acids which it contains are set free by being charged with carbonic acid gas. In order that we might arrive at a safe conclusion as regards the value of the Hermite solution as a disinfectant, it was desirable that we should compare its action on stools with those two methods which have recently been recommended from a scientific point of view. In addition these results would be of great interest and also of practical importance, since the question as to how we may best sterilise stools which are supposed to contain typhoid and cholera bacilli is one which is constantly cropping up, and is still in a very unsettled condition. Bleaching powder and caustic lime solutions have both been very exhaustively examined in and reported upon from Koch's laboratory,[4] and more recently bleaching powder has been investigated in and recommended from Pasteur's Institute.[5] We have accordingly carried out experiments on portions of the same fluid stool—first, with Hermite solution in three different strengths; secondly, with solutions of bleaching powder which recorded the same amount of available chlorine when titrated with arsenious acid; and, thirdly, with solutions of caustic lime of three different strengths.

The stool in this case contained far fewer organisms, as will be seen on comparing the results obtained in this control experiment with those recorded in the first experiment. In this respect it was hardly so well suited for this experiment, inasmuch as when undergoing the process of sterilisation the number of colonies obtained frequently fell so low that the element of chance, so to speak, must be taken into consideration even as to whether a negative or positive result was to be recorded. Thus we state that in the control plate 400 colonies were present per cubic centimetre, and that none of these were recognised as belonging to the potato bacillus group; but as the number present was calculated only from a fractional part of a cubic centimetre, in which comparatively few colonies were present, owing to our having expected a much larger number of organisms, we are not treading on very certain ground when we assume that some of these were not present in every cubic centimetre, and, as will be seen from the table, this organism was met with on several occasions.

As we have already mentioned, we are placed at a certain disadvantage in drawing our conclusions from the relatively small number of organisms which were originally present in the stool. Thus, in the case of the portion of the stool which was treated with Hermite solution at the strength of 0·7 gramme chlorine per litre, we find at thirty minutes only one

[4] Nissen: Ueber die disinficierende Eigenschaft des Chlorkalks. Zeit. f. Hygiene, Bd. viii., 1890. Liborius: Einige Untersuchungen über die disinficierende Wirkung des Kalkes. Zeit. f. Hygiene, Bd. ii., 1887. Pfuhl: Ueber die Disinfection der Typhus und Cholera ausleerungen mit Kalk. Zeit. f. Hygiene, Bd. vi., also Bd. vii., 1890.

[5] Chamberland et Fernbach: Annales de l'Institut Pasteur, Bd. vi., 1893.

colony (potato bacillus), at two hours no growth in broth, and at twenty-four hours one colony in gelatine, while the broth remained sterile. In this case, as the strength of the Hermite solution was still such as to exert an active influence on vegetative micro-organisms, there is little doubt but that we have to deal with the resistant spores, and that, therefore, the obtaining of a positive or negative result was a mere matter of chance when these were distributed in such comparatively small numbers throughout the fluid. It will be noticed here, also, that, as in the previous case, where the weak solution, 0·25 gramme, was used a large number of organisms were obtained in twenty-four hours; we would again ascribe this to the breaking-down of the particles having occurred at a time when the antiseptic value of the solution had already fallen to such an extent that it was no longer able to overtake its work.

In the case of the bleaching powder solution it is at once apparent that the immediate action on the organisms present is not nearly so great as in the case of the Hermite solution,

TABLE VII. — COMPARISON OF RELATIVE ANTISEPTIC ACTION ON FLUID STOOLS OF HERMITE FLUID, BLEACHING POWDER SOLUTION, AND CAUSTIC LIME SOLUTION.

Antiseptic Action of Hermite Solution on Emulsion of Stool with Urine.

Gramme of available chlorine in Hermite solution per litre.	Time when tested.	Gramme of available chlorine in mixture per litre.	Average number of colonies per c.c. in gelatine plates or growth in broth.
0·70	5 minutes	..	12 colonies.
0·70	30 minutes	0·294	1 potato bacillus colony.
0·70	2 hours	..	Broth; no growth.
0·70	24 hours	0·105	1 colony.
0·70	24 hours	0·105	Broth; no growth.
0·50	5 minutes	..	20 to 30 colonies.
0·50	30 minutes	0·259	12 colonies.
0·50	2 hours	..	Broth +.
0·50	24 hours	0·056	No colonies.
0·50	24 hours	0·056	Broth; no growth.
0·25	5 minutes	..	20 to 30 colonies.
0·25	30 minutes	0·070	6 colonies.
0·25	2 hours	..	Broth +.
0·25	24 hours	0·035	80 to 100 colonies.
0·25	24 hours	0·035	Broth +.

Control plate gave on an average 400 colonies per c.c., all non-liquefying, of the bacterium coli commune type.

TABLE VII.—*Continued.*

Antiseptic Action of Bleaching Powder Solution on Emulsion of Stool with Urine.

Gramme of available chlorine in bleaching powder per litre.	Time when tested.	Gramme of available chlorine in mixture per litre.	Average number of colonies present per c.c. in gelatine plates or growth in broth.
0·70	5 minutes	..	100 to 150 colonies. Apparently all liquefying.
0·70	30 minutes	0·448	80 to 100 colonies. Apparently all liquefying.
0·70	1½ hours	..	Broth+; became rapidly turbid.
0·70	24 hours	0·196	No colonies.
0·70	24 hours	0·196	Broth; no growth.
0·50	5 minutes	..	200 to 400 colonies, liquefying and non-liquefying.
0·50	30 minutes	0·343	120 to 200 colonies.
0·50	1½ hours	..	Broth +; became turbid in 24 hours.
0·50	24 hours	0·112	30 colonies.
0·50	24 hours	0·112	Broth +.
0·25	5 minutes	..	60 to 80 colonies.
0·25	30 minutes	0·161	60 colonies.
0·25	1½ hours	..	Broth +.
0·25	24 hours	0·056	12 colonies.
0·25	24 hours	0·056	Broth +.

Control plate gave on an average 400 colonies per c.c., all non-liquefying, of the Bacterium coli commune type.

TABLE VII.—*Continued.*

Antiseptic Action of Caustic Lime Solution on Emulsion of Stool with Urine.

Percentage of caustic lime present in solution employed.	Time when tested.	Average number of colonies present per c.c. in gelatine plates or growth in broth.
2½	5 minutes	80 to 100 colonies.
,,	30 minutes	25 to 50 colonies.
,,	1 hour	Broth; no growth.
,,	24 hours	2 colonies.
,,	24 hours	Broth; no growth.
1	5 minutes	200 to 300 colonies.
,,	30 minutes	200 to 300 colonies.
,,	1 hour	Broth; no growth.
,,	24 hours	2 to 3 colonies.
,,	24 hours	Broth; no growth.
½	5 minutes	200 to 300 colonies.
,,	30 minutes	200 to 300 colonies.
,,	1 hour	Broth +.
,,	24 hours	15 colonies.
,,	24 hours	Broth +; potato bacillus present, perhaps with others.

Control plate gave on an average 400 colonies per c.c., all non-liquefying, of the bacterium coli commune type.

where, even in five minutes, the majority of the organisms present (probably all those vegetative forms which were freely exposed to its action) are at once killed off. When, however, allowed to act for a longer period in the case of the stronger solutions the final result obtained was very similar; this is what we might naturally expect when we consider the chemical nature of the two solutions. In the case of the Hermite solution the available chlorine is present, in great part at any rate, in a free or only weakly combined condition, whereas the bleaching powder solution appears to give off its chlorine much more slowly, as will be at once seen on comparing the third columns of the individual tables, owing to its probably having first to undergo a process of chemical decomposition before it comes into operation. The great chemical difference in the activity of the two solutions is at once made manifest if we test their bleaching action on blue litmus paper. In the one case a bleaching action shows itself at once, whereas in the other none will manifest itself unless the active ingredients are set free by the addition of carbonic acid gas or some other acid.[6] Although in consequence of this the bleaching powder does not exert so rapid and immediate a sterilising action as the more unstable Hermite solution, yet it will be observed that its weaker solutions, owing to their stability, in the end produce a much more complete process of sterilisation than in the case of Hermite solutions of similar dilution.

The caustic lime solution is also a very efficient antiseptic if sufficient time is allowed for its action to come into full play, even the $\frac{1}{10}$th per cent. solution being apparently capable of rendering a stool innocuous so far as the presence of pathogenic germs is concerned. It has, however, one very serious objection as regards the æsthetic aspect of the question, since its addition seems to set free the methylamine and other compound ammonia bases which are present in the fæces, and thus to give rise to a most obnoxious fishy odour.

Antiseptic Action of Hermite Solution on Pure Cultures of Micro-organisms.

As our object in these experiments was to decide, as definitely as possible, the strength of the solution which should be supplied for use to the waterclosets, in order that all danger from pathogenic organisms might be obviated, our method of experimentation departed somewhat from that usually adopted in such antiseptic investigations. Broth cultivations are usually employed for this purpose, as these are most convenient, and it has even been urged by Liborius and others that, from its albuminous constituents and the

[6] Most other acids by their chemical action would set free chlorine, which would no doubt be equally efficacious if the solution were used at once, but carbonic acid is the only one which we can recommend as suitable for preparing an "artificial" Hermite solution; by its action HClO (hypochlorous acid) is caused to be potentially present and ready to come into operation when required. Other stronger acids, by setting free the chlorine present, give rise to a most objectionable odour, which renders it quite unsuitable for most purposes.

masses of organisms which occur in the membranes formed on the surface and in the sediment which may protect it from the direct action of the antiseptic, we may compare the action of the antiseptic on such a medium to what would occur in a cholera or typhoid stool. As, however, the chemical inter-action which takes place on the addition to broth of a very dilute solution of the oxychlorine compounds such as are present in the Hermite fluid is a very complex one, and probably varies very much according to the nature of the albuminoid constituents, any process of reasoning based on such results are open to very grave objections. We preferred, therefore, to carry out our experiments, as a rule, in sterile distilled water, where we could compute by titration the exact amount of available chlorine which came into operation in each case, and, as will be observed, the results obtained in this way are remarkably constant and regular. In addition, as we could ascertain, exactly, what strength of solution is being supplied to the waterclosets and the amount of chlorine that is still available in the effluent, we ought to be able to form a very fair idea as to what would be the fate of any pathogenic germs which might happen to be present in the watery solution which passes into the sewers.

The fluid containing the micro-organisms used in these experiments was obtained by adding a small quantity of sterile distilled water to a fresh oblique agar culture of the microbe which was being tested. In the course of a few minutes the greater part of the culture had been taken up by the water, which now presented a homogeneous and milky appearance, and contained the organisms in a state of equable division, with no large clumps or fragments of the culture which would offer a greater resistance to the disinfecting action. The Hermite solution was naturally titrated at the beginning of each experiment by the addition of a measured quantity of arsenious acid, which was then titrated back by means of standard iodine solution. It will be observed that the strengths experimented with varied very much, and are not usually round numbers, and this was due to the fact that we found it most convenient to take dilutions and fractions of the Hermite solution in sterile distilled water at the date of experiment, whatever that strength might happen to be. From the dilutions of Hermite solution of different strengths, containing the microbe being experimented with, inoculations of three drops were made into broth by means of a large platinum loop, at varying intervals of time, to test the action of the fluid. These experiments were carried out at a temperature of about 15° C. as being that which was most convenient and at the same time that which approximated sufficiently closely the temperature (12° to 13° C.) in the syphons. As examples of pathogenic organisms upon which the Hermite solution would have to act in practice we give typhoid, cholera, and diphtheria.

These tables indicate at once that the Bacillus typhosus exhibits much greater resistance to the action of the Hermite solution than those of either cholera or diphtheria, and this manifests itself not merely in the strength required to be used, but also in the fact that the time element appears here to exert

TABLE VIII.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

TYPHOID.

Available gramme of chlorine present per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Thirty minutes.	One hour.	Twenty-four hours.	The original dilutions of Hermite fluid were re-inoculated with B. typhosus on the fifth day, and after standing twenty-four hours were tested by inoculations into broth.
0·60	+	—	—	—	..	..	..	..
0·30	+	—	—	—	..	..	..	..
0·30	..	—	..	..	..	..	—	+
0·20	+	—	—	—	..	..	..	..
0·17	+	+	—	—	..	..	..	..
0·15	+	+	+	+	..	..	..	..
0·15	..	+	..	+	..	..	—	+
0·13	+	+	..	..	..	..	..	..
0·12	+	+	+	+	..	..	..	..
0·10	..	+	..	..	+	+	—	+
0·05	..	+	..	..	+	+	+	+

TABLE IX.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

CHOLERA.

Available gramme of chlorine present per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Thirty minutes.	Forty-five minutes.	One hour.	Twenty-four hours.	Ninety-six hours.
0·6	—	—	—	—	..	..	..	..	..
0·50	—	—	—	—	..	..	..	..	..
0·30	—	—	—	—	..	..	..	..	..
0·25	—	—	—	—	..	..	..	..	..
0·20	—	—	—	—	..	..	..	..	..
0·18	—	—	—	—	..	..	..	..	..
0·15	—	—	—	—	..	..	..	..	..
0·135	—	—	—	—	..	..	..	..	..
0·120	—	—	—	—	..	..	..	..	..
0·120	..	—	—	..	..	..	..	..	..
0·100	—	—	—	—	..	..	..	..	..
0·075	..	—	—	—	..	..	..	..	..
0·060	—	—	—	—	—	..	—	—	—
0·058	..	—	+*	—	—	..	..	..	—
0·040	..	—	—	—	—	..	..	..	—
0·025	..	+	..	+	+	+	+	+	+
0·0125	..	+	..	..	+	+	+	+	+

* The positive result recorded in this case, in view of the others being negative, is almost certainly due to the drop taken for inoculation having contained a small fragment of culture, which would undergo sterilisation with much greater difficulty than when the organisms were broken down into their discrete members.

TABLE X.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

DIPHTHERIA.

Available gramme of chlorine present per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Thirty minutes.	Forty-five minutes.	One hour.	Seventy two hours.
0·45	—	—	—	—	..	..	..	..
0·225	—	—	—	—	..	..	..	..
0·150	—	—	—	—	..	..	..	..
0·150	..	—	—	..	..	..	..	—
0·110	—	—	—	—	..	..	..	..
0·100	..	—	..	—	..	..	..	—
0·090	+	—	—	—	..	..	..	..
0·050	+	—	—	—	..	..	..	..
0·050	+	—	..	—	—	..	—	—
0·033	..	+	..	+	+	..	+	—
0·020	..	+	..	+	+	..	+	+
0·0125	..	+	..	+	+	+	+	+

an important influence, while in the case of the latter two much smaller quantities of the fluid are required, and the question of time does not appear to come markedly into play, as the antiseptic either kills them off at once (within the first five minutes) or appears to exert little further influence. Too much stress must not be laid upon the results in the second column, marked "immediate," as the period during which the organisms were subjected to the influence of the solution naturally varied considerably, and other factors which we could not control would without doubt come into play. They are given, however, as examples of what we may term the "instantaneous" action of the Hermite solution. In the last column of Table VIII. we have an experiment in which we test bacteriologically the rapidity with which the antiseptic value of the Hermite solution (of varying strengths) falls when allowed to stand for five days. The original solutions, which we now knew to be sterile, were reinoculated from a fresh typhoid culture and after standing for twenty-four hours were again tested in broth. From the results obtained we may conclude that the solution at 0·30 gramme had fallen to at least 0·15 gramme of available chlorine strength and perhaps lower. It must of course be remembered that

we have not merely the solution diluted to this strength, but have also the addition of the microbes experimented with. The influence of these, however, can be left practically out of account, as their addition exerted no influence on the strength of the solution when determined by titration.

In order that we might rank the Hermite solution with greater certainty in its proper position as an antiseptic we carried out some further experiments on some of those more resistant test organisms which are usually employed for scientific purposes in ascertaining the antiseptic power of any chemical substance. As examples of its action on spore-free cultures we give the following tables :—

TABLE XI.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

MICROCOCCUS PRODIGIOSUS.

Available gramme of chlorine present per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Thirty minutes.	One hour.
0·54	+	—	—	—	..	..
0·270	—	—	—	—	..	..
0·180	+	+	—	—	—	..
0·135	+	+	+	—	—	..
0·108	+	+	+	—	—	..
0·060	+	+	+	+	+	+

TABLE XII.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

STAPHYLOCOCCUS PYOGENES AUREUS.

Available gramme of chlorine present per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Forty-eight hours.
0·53	—	—	—	—	..
0·265	—	—	—	—	..
0·176	+	—	—	—	..
0·132	+	—	—	—	..
0·106	+	+	—	—	..
0·100	+	+	—	+	+
0·060	+	—	+	—	..
0·050	..	+	..	+	+
0·033	..	+	..	+	+
0·025	..	+	..	+	+
0·012	..	+	..	+	+

TABLE XIII.

Antiseptic Action of Hermite Solution diluted with Distilled Water.

ANTHRAX BACILLI (SPORE-FREE).

Gramme of available chlorine in Hermite solution per litre.	Immediate.	Five minutes.	Ten minutes.	Fifteen minutes.	Thirty minutes.	Twenty-four hours.
0·500	—	—	—	—	..	..
0·270	—	—	—	—	..	..
0·250	..	—	..	..	—	..
0·135	—	—	—	—	..	..
0·125	..	—	..	..	—	..
0·100	—	—	—	—	..	..
0·060	+	—	—	—	..	..
0·160	..	—	..	..	—	..
0·030	..	—	..	..	—	..
0·025	..	—	..	..	—	..
0·015	..	—	..	..	—	..
0·007	..	+	..	..	—	..

Tables XI. and XII. present a gradual fall or curve similar to that observed in the case of the resistant typhoid bacillus. In the anthrax experiment, Table XIII., we have a state of affairs more closely analogous to that which is exhibited in the case of cholera and diphtheria. This organism, indeed, would from our experiments appear to manifest a most remarkable susceptibility to the action of the fluid, but this may, perhaps, in part be ascribed to the special susceptibility of the sample of anthrax used and the conditions under which the experiment was carried out. The spores produced by this culture, as we shall see later (Table XIV.), were not very resistant, and as we had to make use of very fresh cultures, which had only been incubated for twenty-four hours, in order to avoid the presence of spores, the young organisms would probably not have acquired their full powers of resistance. Too much stress must not accordingly be laid upon these results as, in addition, the table in itself is somewhat incomplete.

Antiseptic Action of Hermite Solution on Spore containing Cultures.

The first experiments in this series were carried out on the sample of anthrax which we happened to have in our laboratory. As, however, these spores seemed to be very easily killed we proceeded to test their resistance by Esmarch's method, since, as is well known, cultures of different origin vary enormously in this respect. We found by this means that those with which we were working exhibited comparatively little resistance. We accordingly carried out other experiments with a culture of the very resistant spores of Bacillus mesentericus vulgatus (potato bacillus) which we had separated from the effluent at Worthing.

TABLE XIV.

Antiseptic Action of Hermite Solution on Anthrax Spores.

Gramme of available chlorine in Hermite solution per litre.	Thirty minutes.	One hour.	Twenty-four hours.
0·75	—	—	—
0·50	—	—	—
0·35	—	—	—
0·25	+	—	—
0·15	+	+	+

TABLE XV.

Antiseptic Action of Hermite Solution on Spores of Bacillus Mesentericus Vulgatus (Potato Bacillus).

Gramme of available chlorine present per litre.	Fifteen minutes.	One hour.	Twenty-four hours.	Seventy-two hours.
0·75	—*	+*	—	—
0·50	+	+	+	+
0·25	+	+	+	+

* Probably a mis-inoculation, or perhaps the *plus* at one hour may have been due to the presence of a larger mass of the spores which had escaped the action of the antiseptic.

The action of even comparatively weak solutions appears to be very rapid on anthrax spores, but we must place much more reliance on the experiments with the potato bacillus spores, which required much stronger solutions to operate over a considerable interval of time in order to produce, with certainty, complete sterilisation.

Antiseptic Action of Hermite Solution on Broth Culture.

These experiments were carried out in order that we might the more readily institute a comparison of our results with those of other observers which were usually made on this medium. We have already stated our objections to the use of broth in such experiments, since the inter-action of the different bodies present in the medium on the antiseptic introduces a series of new factors which we are quite unable to determine. The unequal distribution of the bacilli throughout the fluid also tends to give irregular results, so that this method of working is not nearly so satisfactory. The organism which we employed was Koch's cholera bacillus, and the results obtained on the two occasions in the experiments detailed in the table, as will be seen, varied somewhat, which variation is, no doubt, to be ascribed to special conditions of the organisms in the cultures.

On comparing the results described in this table with those obtained with cholera in distilled water, treated with the Hermite solution (Table IX.), it will be seen that at least

TABLE XVI.

Antiseptic Action of Hermite Solution mixed with equal parts of Broth Culture of Cholera.

Gramme of available chlorine calculated as present in mixture per litre.	Five minutes.	Ten minutes.	Fifteen minutes.	Twenty-four hours.
0·400	—	..	—	—
0·350	..	—	..	..
0·330	—	..	—	—
0·330	—	..	—	—
0·250	—	—	—	—
0·250	—	..	—	—
0·150	..	—	..	..
0·125	—	..	+	—
0·125	+	..	+	—
0·100	..	+	..	..
0·080	—	..	—	+
0·083	+	..	+	—
·050	..	+	..	..
0·030	+	..	+	+
·025	..	+	..	..

twice as much of the Hermite solution is required—probably considerably more—to ensure sterilisation.

Similar experiments were made with Bacillus typhosus, and these again indicated that the action of the antiseptic was reduced to one half or less of its previous disinfecting power up to the first five or ten minutes of its operation, but we have observed, on the other hand, on several occasions, that its efficiency seemed, after this time, to be not merely recovered in the stronger but even in the weaker dilutions—a very remarkable result, and one which requires further investigation. It would appear, indeed, as if the chlorine bodies formed some passing combination with the medium, by which these substances acted as a carrier by means of which the antiseptic was handed on again in an even more efficient form to the micro-organisms. It is probable that a similar action may occur on its addition to urine.

We have now to consider briefly the chemical changes which appear to take place when the Hermite solution is added to a mixed stool, and the way in which the oxychlorine compounds probably exert their antiseptic action. The urine is certainly that portion of the mixture which exerts the most marked influence, inasmuch as, on its addition, an immediate and most important fall takes place in the strength of the chlorine solution. The reaction takes place probably on similar lines to that which occurs when we use hypobromite of soda in the estimation of urea, the hypochlorous acid being reduced and chlorine set free, which may, however, immediately undergo some secondary change. It had been found that 1 c.c. of urine added to 25 c.c. of the Hermite solution produced the maximal fall which could be obtained by its addition, which would seem to indicate that this quantity was able to use up all the chlorine compound (hypochlorous acid?) present; we have, therefore, made the following experiment with Bacillus typhosus to ascertain what influence the urine exerted on the antiseptic action of the Hermite solution:—

TABLE XVII.

Antiseptic Action of Hermite Solution mixed with a Tenth Part Urine and diluted with Distilled Water.

TYPHOID

Available gramme of chlorine present per litre before mixing with urine.	Amount of chlorine calculated by the arsenious acid method after mixing with urine.	Five minutes.	Twenty-four hours.	The original dilutions of the antiseptic solution were reinoculated with typhoid on the fifth day, and after standing twenty-four hours were tested by inoculations into broth.
0·60	0·270	—	—	—
0·30	0·135	+	—	+
0·12	0·054	+	—	+
0·10	0·045	+	—	+
0·05	0·022	+	—	+

At the same time a similar set was made with the Hermite solution without the addition of urine as a control, but the limits attained were precisely like those already recorded in our table (VIII.) on typhoid bacillus in distilled water. It will be seen from these tables that as regards the immediate action, tested in five minutes, the antiseptic value is reduced to about one-half on the addition of urine—that is to say, to the amount given by titration with arsenious acid; on the other hand, it appears that the antiseptic power which seems to have been lost, if it is given sufficient time to operate, is still available, as in twenty-four hours the solution with urine exerts the same influence as that without—indeed, it seems more active, perhaps because more permanent, as though it were now fixed in a stabler form, as the dilution 0·50 gramme chlorine solution, with the addition of urine, was able to sterilise typhoid culture in twenty-four hours, although the other was still capable of growth.

The question now comes to be, Are we correct in assessing the antiseptic value of the Hermite solution in terms of available chlorine, as in that case a solution of chlorine water of equivalent strength should exert a similar action? This question we have attempted to answer in the following table:—

TABLE XVIII.

Antiseptic Action of Chlorine Water.

TYPHOID.

Gramme of available chlorine present per litre.	Five minutes.	Twenty-four hours.	The original dilutions reinoculated on the third day with bacillus typhosus were, after standing thirty minutes, again inoculated into broth.
0·70	—	—	—
0·35	—	—	—
0·23	—	—	+
0·14	+	—	+
0·10	+	—	+
0·05	+	—	+
0·03	+	+	+

On comparing this table with the results obtained with Hermite solution, given in Table VIII., it will be found that the two correspond almost exactly, or, at any rate, vary only within the limit of experimental error. Thus, 0·17 and 0·05 of Hermite solution give a positive result in five minutes and twenty-four hours respectively where 0·14 and 0·03 of free chlorine are required to produce the same results. We are accordingly warranted in concluding that we may generally estimate the antiseptic value of the different oxychlorine compounds present in the Hermite solution in terms of their available chlorine or oxydising power, although we are unable to define to what extent the antiseptic action is due directly to the chlorine or to its indirect action as an oxidising agent. They, however, no doubt vary very much as regards the readiness with which they exert this action, some being more stable than others, and it would also seem that some of them are able to form comparatively stable compounds with other substances, by means of which their antiseptic power may be retained almost indefinitely; thus we have found that samples of broth which had received comparatively small quantities of the Hermite solution, even after seven weeks contained a sufficient amount of available chlorine to be titrated in the form of iodine by means of thiosulphate of sodium. We have observed also that the effluents from Yard B, which appeared at first to continue to fall in their available chlorine, seemed after a time to remain stationary. If the antiseptic value of the fluid, then, depends merely on the available chlorine, may we not substitute a solution of bleaching power of equivalent strength as being probably much less expensive and more easily prepared. Our experiments with typhoid cultures, however, would seem to indicate that at least half as much again of this solution is required to produce the same result in the same time, although from its greater stability it is perhaps more efficacious when allowed to act over a longer period. Our "artificial" Hermite solution, prepared by passing carbonic acid gas through the bleaching powder, gave varying results, due to some factor which, for the present, escapes us, and, although the bleaching powder solution is rendered

slightly more powerful, still it could not be depended upon to exert, constantly, an equivalent action to the Hermite solution. The influence of the carbonic acid gas is, however, brought out in a most striking fashion by our experiments, shown in Table XIX., on the very resistant spores of Bacillus mesentericus vulgatus.[7]

Although the value of the bleaching powder solution is thus shown to be immensely increased as regards spores by the addition of carbonic acid, it would be somewhat rash to assume—indeed, our experiments up to the present negative the supposition—that its influence on vegetative forms is affected to a similar degree; there is no doubt, however, that the presence of carbonic acid gas (perhaps other acids act in a similar fashion when the mixture is to be used at once) is a distinct advantage, inasmuch as it renders very much more rapid the process of sterilisation. We have,

TABLE XIX.

Antiseptic Action of Bleaching Powder with and without the Addition of Carbonic Acid on Spores of Bacillus Mesentericus Vulgatus (Potato Bacillus).

Bleaching powder.			Bleaching powder through which carbonic acid gas has been passed.
Gramme of available chlorine in bleaching powder solution per litre.	Five minutes.	Thirty minutes.	Five minutes.
24·0	+	+	—
12·0	+	+	—
4·8	+	+	—
2·4	+	+	—
1·2	+	+	—
0·8	+	+	+
0·6	+	+	+
0·3	+	+	+

indeed, in this solution a cheap and readily procurable substitute for the Hermite solution, which, like the original, is devoid of any really objectionable smell, and is equally efficacious for any of the ordinary purposes of disinfection.

If we compare the action of the Hermite solution as an antiseptic with carbolic acid, the superior efficiency of the former is so evident, even in solutions of relatively great dilution, that we are left in no doubt as to which is to be preferred. The only substance used as an antiseptic, which operates in solutions of such great dilution, is corrosive sublimate, $HgCl_2$, and, although the laboratory experiments might appear to give it a certain advantage, we are confident that the facility with which it unites with organic bodies, and thereby becomes inert, would render it very much less efficacious than the Hermite solution for general use as a practical disinfectant. The electrolysed sea water or our "artificial" Hermite solution appears, indeed, while exerting a specific disinfecting action on the organisms, at the same time to be used up and destroyed to a much less extent by the organic matter present than any other disinfectant with which we are at present acquainted.

In applying the results which we have obtained from our examination of the Hermite system carried out on the spot and our more extended laboratory experiments, it must first be stated that all investigators who have occupied themselves with the question of the sterilisation of stools have found it most difficult to render them absolutely sterile in a short space of time by the ordinary means available, and have accordingly addressed themselves more to the solution of the problem of what would be sufficient to free them from the pathogenic germs, such as those of typhoid fever and cholera, which might be present. We are quite satisfied from our examination of the effluent in Yard B that all such would be effectually dealt with, as the more resistant Bacterium coli commune appears to be destroyed. It is probable from a number of observations which we have made, which it is unnecessary for us here to record, that the titrations of the effluent do not really indicate fairly its antiseptic power, but that this is really much greater than the arsenious acid method would lead us to expect. It will also be noticed that the higher strengths of solution supplied from the distribution tanks do not so markedly raise the amount of available chlorine in the effluent as might be expected, and this is to be accounted for by the more unstable portion of the solution being at once converted into some other form, which, although not indicated by the arsenious acid titration may still be effective as an antiseptic. The bacteriological results also are not improved to such an extent as to warrant us in recommending the adoption of such strong solutions of the Hermite fluid, as this would necessarily entail no inconsiderable addition to the cost involved in the adoption of the system; a strength of between 0·50 and 0·60 gramme chlorine per litre is all that we should consider necessary to effect the proposed objects of this method of sewage treatment. The adoption of any mixed system in which the house water, even without the storm water, is allowed to enter the drum in which the sewage undergoes treatment must, so far as we can see at present, always be accompanied by the danger that the whole object of the scheme may be rendered futile from the fact that we must rely wholly upon the care and judgment of the inmates of the household for the addition of sufficient quantities of the antiseptics from the sink. The application of the solution for watering the streets does not, we think, require serious consideration. The question of the flushing of the drains requires, however, further investigation, as, although the direct antiseptic action would probably be small, the deodorising and cleansing effects might have some value, but this can only be decided by direct experiment. The application of the system to hospitals in the complete form recommended by M. Hermite has much to be urged in its favour. The regular disinfection of all objects which have been exposed to contamination in the wards or in the side rooms by such a powerful disinfectant, which would always be at hand, must minimise the risk of the spread of infection which emanates from all such centres of disease. Its substitution in laboratories for the ordinary disinfectants now in use also follows as a natural consequence, and, inasmuch as what may be termed the "artificial" Hermite solution can be made to any strength at an insignificant cost, whilst the electrolysed sea water can be raised to a strength of only a little over one gramme chlorine per litre, and this at an ever relatively increasing cost, it offers very obvious advantages for such purposes.

The development of the Hermite system must be regarded as merely one of the signs of a distinct movement in sanitary science which for some time has been manifesting itself in other directions. The idea of cutting off the prime etiological factor by sterilising whatever is supposed to contain the infective agent is at present the main standby of preventive medicine, Mr. Henman having quite recently even applied the idea to the prevention of the spread of infection from fever hospitals by means of a system of ventilation in which the air is subjected to processes of filtration and sterilisation before it is allowed to pass outside the infected buildings; this is also seen very clearly in the strong tendency of modern sanitation as regards cremation of cadavers. On the other hand, another system—that of Mr. Seymour Haden—appears to advance in quite an opposite direction, inasmuch as the burial of the body in as unprotected a fashion as possible is resorted to in order that the processes of putrefaction may proceed more rapidly and the organism be resolved into its component elements. In a similar way Mr. Scott Moncrieff, instead of endeavouring to "sterilise" the sewage, has introduced a system in which he proposes to facilitate the processes of putrefaction by placing the sewage under specially favourable conditions to bring about that end, so that the complex organic matter may be broken down as rapidly as possible into a series of lower compounds, which can be taken advantage of for agricultural purposes, whilst at the same time he relies upon the vigorous action of the putrefactive organisms and the conditions produced by them to destroy or render inert any pathogenic micro-organisms which may happen to be present. As to which of these two methods will finally triumph, or whether they may not in the future be combined and come into common operation, it is at present somewhat difficult even to venture an opinion.

*** This report of our Special Analytical Sanitary Commission on the Hermite Process of Sewage Treatment by Electricity is reprinted in pamphlet form, and can be obtained on application to the Manager at THE LANCET Offices.

[7] We find that a very similar observation has been recorded by Chamberland and Fernbach, loc. cit., but our results in certain respects do not correspond.

THE REPORT OF THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA FOR 1892.

[SECOND NOTICE.]

TURNING to the subject of enteric fever in the European army of India the Sanitary Commissioner gives two tables—one showing the admission- and death-rates from enteric and from intermittent, remittent and simple continued fevers for two decennia, and for the last two years; and the other showing the mortalities only from these fevers respectively during the same periods. From these tables it is clear that there has not only been an increase in the diagnosis of enteric fever, but also, as evidenced by the rising mortality, a real increase of enteric fever. In the last ten years, and especially of recent years, there has been an increase in the total fever mortality, usually ascribed to the greater youthfulness and recent arrival of the soldiers of to-day, and an increase of mortality from enteric fever, accompanied by a decrease in mortality from the other fevers, which, the Sanitary Commissioner remarks, is probably partly due to increased susceptibility on the part of the army from youth and recent arrival, and partly due to the greater frequency with which the diagnosis of enteric fever is now made.

The following table shows the admission- and death-rates per 1000 from enteric fever in the European troops, native troops, and native gaol population of India.

	1882–1891.		1892	
	Admissions.	Deaths.	Admissions.	Deaths.
European troops	14·7	4·13	22·1	5·42
Native troops	0·3	0·09	0·4	0·13
Native gaol population	0·2	0·10	0·3	0·15

The results of this comparison are very striking, and we have on previous occasions called attention to the subject. The figures have repeated themselves over such an extended period, and have been so consistent with one another, as to leave little room for doubt that they express the facts. Post-mortem examinations are rarely obtained in the case of native soldiers, but among prisoners nearly every fatal case of disease is subjected to such examination; and as the results are practically identical in the two classes, it may be assumed that native troops really suffer much less than the European from this fever. Nor is this a mere matter of diagnosis, for the mortality from all kinds of fever in the European and native armies is not the same in amount. For these and other reasons set forth in the report under review it may be fairly regarded as proved, we think, that native soldiers and prisoners are less liable to contract enteric fever than Europeans.

We need not apologise for going into this subject a little further than usual, in consequence of its being very important, to see if we can discover anything likely to throw any light upon this remarkable susceptibility on the part of the young and recently arrived European soldiers to contract enteric fever. The annual average strength of the native army in 1892 was upwards of 127,000, and that of the gaols over 103,000, so that the figures are sufficiently large to enable us to make statistical deductions. There is no history of epidemic outbreaks of enteric fever among the gaol population, and between 1871 and 1876, out of a total gaol population in the Bengal Presidency representing in the aggregate upwards of 398,000 individuals of different ages, only twenty-eight are returned as dying of enteric fever. The relative rarity of this fever among natives of India is, moreover, corroborated by what Surgeon-Lieutenant-Colonel Crombie recently stated as the result of an examination of twenty years' records of the Calcutta hospitals and of his own experience; that he himself was not aware of ever having seen a case of enteric fever in a native of Bengal, although he had seen cases among Gurkhas and Burmans. Assuming, then, this comparative immunity from enteric fever on the part of the natives of India to be correct, it has been thought that an explanation of it may be obtained in one of two directions; that, on the one hand, the natives pay their tribute to the disease in early life, and that the diarrhœa of native children is but a mild unrecognised form of enteric fever which is largely protective against subsequent attacks; or that, on the other, constant residence amidst insanitary causes and conditions has made the native immune to the enteric fever cause. Be this as it may, with regard to the natives of India generally, enteric fever seems to occur—and the exception, if true, is significant—in Nepaul among the Gurkhas and Mongolian Newars who live in a more temperate climate and approach nearer to the European races in respect of their consumption of meat and alcohol. The development of bacteriological science has of course profoundly affected and enlarged our etiological and pathological views of disease. Repeated observations by many observers have shown that the typhoid bacillus is pretty constantly present in cases of enteric fever, and of late attempts have been made to connect the *rôle* of the bacillus coli communis as a pathogenic organism with the phenomena and morbid lesions of that disease. It has not yet been established, however, that the two organisms are identical or that the bacillus coli communis can be made to assume the cultural properties of the typhoid bacillus. The history of the latter micro-organism outside the human body—in water and soil in relation to the fouling of either, in relation to the movement of ground water in permeable soils and to decomposing organic matter—has yet to be worked out, as well as the methods and channels by which the typhoid bacillus and its spores gain an entrance to the body. Assuming that bacillus to be the *vera causa* of enteric fever, our researches are narrowed down to the consideration of how, and under what circumstances, it gains its access into the human system. On the other hand if, as the Lyons School of Bacteriologists contend, the typhoid bacillus be merely a variety of the bacillus coli communis there may be good ground for the belief that enteric fever itself, or fevers having a closely allied pathology to enteric fever, may be originated autogenetically under certain conditions. Nor is this question altogether devoid of practical interest. It is not even the bacilli that are so much a matter of hygienic importance and difficulty as the spores of pathogenetic micro-organisms, which are endowed with such vitality and such resistant and potentially dangerous properties. The old idea of the use of filters is an exploded one; it is the sterilising properties of a filter that are the important consideration, and it is in this respect that the use of the Chamberland filter has proved such an eminently successful hygienic agent in the French army, and the Nordtmeyer-Berkefeld filter equally efficacious among the Germans. It should surely be possible to put these filters and their fever protecting properties to experimental trial under certain conditions in Indian cantonments. For that purpose a body of freshly arrived European troops might be selected, or some station chosen where enteric fever had so persistently appeared that it might be regarded as endemic there. The results of the use of these filters for a year should go far to determine whether the water was the vehicle for the spread of that disease or not. The causes of the great and increasing prevalence of enteric fever in India do not seem to have been at all definitely determined, notwithstanding that most medical officers in investigating an outbreak examine or discuss in succession each source of infection that can be thought of, not only in regard to the first case, but in each individual successive case.

The percentage of hepatic abscess in the total causes of death was highest in Madras, lowest in Bombay; but the death-rate per 1000 was highest in Bengal, lowest in Bombay. Leaving out the Hill Convalescent Depôts, the highest mortalities were in Burma coast and Gangetic plain, the lowest in the Indus Valley, while in the Burma coast abscess of the liver contributed a much larger share than elsewhere to the total mortality from all causes. In Bengal abscess of the liver was said to have been associated with dysentery in twenty-five out of fifty-four fatal cases; in Madras in five out of thirteen; and in Bombay in two out of the eight.

Passing on to the subject of venereal diseases in the army of India, it is pointed out in a memorandum submitted to the Indian Government by the principal medical officer of Her Majesty's forces, that although those diseases had, owing probably to the short service system, increased generally they were less where there were Lock hospitals than where there were none. Still, it has long been recognised by persons connected with the management of these institutions that they failed to reach all those persons against whom it was intended to protect the troops, and

probably in practice this could never be the case. To this and to the fact that the army, under the short-service system, is a younger and more celebate army, is the failure of the Lock hospitals to check the increase of venereal disease among the troops to be mainly attributed. Let the explanation be what it may, the amount of inefficiency caused by these diseases is a most serious matter. The system of voluntary Lock hospitals does not seem likely to succeed, for as the women realise that no one can force them to go to be treated they have nearly given up attendance.

In a concluding article we hope to discuss the vital statistics and diseases of the native army, gaols, and native population, and to touch upon the subject of cholera in India in 1892.

CHOLERA.

A CASE of supposed cholera has been reported in the village of Waldeck in West Prussia, and inquiries have been instituted from Berlin in regard to it.

We learn from Madrid that some suspicious cases of choleraic diarrhœa have occurred at Saint Nazaire, which has been placed in quarantine.

With the above exceptions, we are glad to say, there is nothing to record regarding the progress of cholera at the present moment.

Public Health and Poor Law.

LOCAL GOVERNMENT DEPARTMENT.

REPORTS OF INSPECTORS OF THE MEDICAL DEPARTMENT OF THE LOCAL GOVERNMENT BOARD.

On the General Sanitary Circumstances of the Ystradyfodwg Urban District, by Dr. BRUCE LOW.—This report is one that was made owing to a complaint by the County Council of Glamorganshire under Section 18 of the Local Government Act, 1888. It had to do with an allegation that the urban authority were not performing their duties under the Public Health Act, 1875, and as such the report naturally deals in considerable detail with the various sanitary circumstances affecting health in the district, such as dwelling accommodation, sewerage and drainage, water-supply, means of refuse disposal, and general sanitary administration. Summarising in the first place the work that has been performed, Dr. Low reports that the authority have constructed seventeen and a half miles of main sewerage; that they are at present engaged at a cost of some £50,000 in making subsidiary sewers, which will tend to the replacement of offensive vault-privies by waterclosets; that they have taken unsuccessful legal proceedings with a view to securing an improved water-supply; that they have made some effort at least to control infectious diseases by means of isolation arrangements; and that they have made some increase in their inspectorial staff; but, on the other hand, Dr. Low explains that the general administration of the authority is lax, that they make bylaws and fail to enforce them, that until recently there has been much apathy as to works of sewerage, that the authority have failed to adopt certain voluntary Acts such as that relating to the notification of infectious diseases, and that they have failed to take action with reference to unwholesome dwellings, the disposal of refuse, and like matters. Reviewing both sides of the question, no doubt remains in Dr. Low's mind that, although the authority have had many difficulties to contend with in connexion with the rapid increase of population, they have failed to perform in an active and efficient matter the duties imposed upon them by the Legislature, duties that become all the more important when it is remembered that the health and well-being of over 88 000 persons are involved. We are glad to find that these complaints are fully investigated, and that by the publication of the reports exposing the results obtained authorities that have been lax have an opportunity of reforming their administration without being exposed to any such vexatious measures as supersession in any branch of their work; and we hope that the opportunities thus afforded will be properly utilised in the direction of improved local administration.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Chelsea Urban Sanitary District.—An analysis of the sex distribution in this district shows that in North Chelsea 55·68 per cent. of the population are females, as against 50·66 and 49·86 in South Chelsea and Kensal Town respectively. This excess is, Dr. Louis Parkes points out, due to the large number of female domestic servants in the northern part of the district. In commenting upon the report of the Royal Commission on the Metropolitan Water Supply, Dr. Parkes remarks, in reference to the recommendations embodied in the report, that if the water supplied to London is to maintain the "high standard of excellence and purity" claimed for it by the Commission these recommendations must be carried into effect with as little delay as possible. The question which suggests itself to us in this connexion is whether it is possible to draw up regulations &c. as to the rate of filtration and frequency of cleansing filter beds &c. without some further inquiry into the whole subject; in other words, whether, as Mr. Shirley Murphy remarks in his report to the London County Council, another Royal Commission is not required to discover how best to carry into effect the recommendations of the last. Referring to the Chelsea Waterworks Company, Dr. Parkes points out that it still occupies the lowest place among the companies as regards the percentage number of its houses on the constant service system, although during the past year the percentage has been raised from 40 to 45. We see, too, by the February returns of the Water Examiner that, on Feb. 28th, 51 per cent. of the houses were on constant service. Among the other metropolitan water companies the Grand Junction takes the lead with 100 per cent. and the East London follows with 97.

Lowestoft Urban and Port Sanitary Districts.—In that part of his report relating to the urban district Dr. Francis Clark gives an interesting chart showing the relation of autumnal diarrhœa in his district to the temperature of the earth at a depth of four feet and to the rainfall. The result is that, as regards temperature, the chart entirely corroborates Dr. Ballard's thesis, and it also tends to show the temporary fall in mortality caused by heavy rainfall, although it appears that the rainfall had little or no effect upon the temperature of the soil at a depth of four feet. We trust Dr. Clark will continue his observations, and we suggest that other curves relating to the temperature of the air, and to that of the earth at a depth of one foot, would also be of interest. As a means of purifying the soil and subsoil Dr. Clark advises that the streets should be watered with electrolysed sea-water, and that the same solution should be used for "the spraying of our slums and alleys." In that part of Dr. Clark's report which has reference to the Port of Lowestoft mention is made of a crew of fishermen who, after having eaten crabs which had been caught at the north entrance of the Humber, apparently near a sewage outfall, were seized with cramps, vomiting, and diarrhœa. One man who desisted from eating the crabs escaped. Four of the crew continued to suffer from diarrhœa and a fortnight afterwards developed enteric fever. The incident occurred while cholera was prevalent at Grimsby.

East Retford Urban Sanitary District.—This district possesses, Mr. Walter Spencer tells us in his annual report, an excellently situated isolation hospital, but, he adds, very few make use of it. He accounts for this by the fact that charges are made for admission which are, in many cases, prohibitive; and he strongly advises that all admissions should be made free. Many would think it a somewhat strange view for a sanitary authority to take of an isolation hospital, presumably erected and maintained for the public good, that persons who isolate themselves or are isolated for the public safety should be made to pay. This question is entirely apart from the expediency in some instances of making charges for special provision—such, for instance, as a private ward or extra nurses, and where, perhaps, isolation for the public benefit is not necessary.

Cheltenham Urban Sanitary District.—The Cheltenham Town Council have decided to grant certificates as regards the sanitary condition of houses in their district at charges ranging from 5*s.* to 21*s*, according to the annual value of the houses; the water test is in every case to be used for the drains. There being no provision for cases of enteric fever at the Delaney Fever Hospital, arrangements have been made by which any cases of the disease sent in by the medical officer of health to the General Hospital shall be treated at

the rate of 3s. a day. As regards water-supply, it appears that Cheltenham has not been in a position to withstand anything like a long drought, and after the experience of last summer it has been decided to obtain water from the Severn, above Tewkesbury, by a separate main, and to use it for sanitary purposes. It seems, however, that although it is not proposed to use the water for drinking purposes unless during times of great drought, that the water is to be always purified by subsidence and filtration. There were four deaths from puerperal fever during the year, and three of these, which occurred within a week of one another, were attended by the same midwife. Dr. J. H. Garrett, on becoming aware of this fact, had energetic steps taken to prevent the midwife from attending other cases.

Bournemouth Urban Sanitary District.—In discussing the influence of schools in the spread of infectious disease, Mr. Philip Nunn, the medical officer of health, remarks that "all Board schools or those receiving Government grants should be under medical supervision, specially in times of epidemics, and frequent opportunity should be given for the examination of pupils attending the same by a recognised Government officer." If outbreaks of such diseases as are spread by school influence are to be checked, it is obvious that some such provision as that suggested by Mr. Nunn will have to be made. Unfortunately, nothing short of a daily examination of all the pupils would be likely to effect the end desired, though no doubt a less frequent inspection would have beneficial results. As regards the water-supply of Bournemouth, Mr. Nunn mentions that, although the water before entering the mains is of excellent quality, it is at times discoloured when drawn from the house taps, an indication, he thinks, that the domestic cisterns or the water mains require more frequent cleansing. A new burial ground is apparently about to be acquired for Bournemouth, and Mr. Nunn advocates the erection therein of a crematorium.

Stafford Urban Sanitary District.—There were, Dr. Milnes Blumer states, five cases of puerperal fever reported during the year 1893, and of these four proved fatal. All these cases had been attended by women in the first instance, and these women were not allowed to attend any other case for a month, and their clothes were disinfected. It seems to us that thorough disinfection of these women's hands and finger nails is also necessary under these conditions, as also of any scissors, tapes, &c., used by the midwives. Probably these points were not overlooked in the above cases.

Hanley Urban Sanitary District.—Typhoid fever was very prevalent in this district during 1893, and Mr. John Clare states that, as regards the distribution of the disease, there was no distinction between houses supplied with waterclosets, cesspools, privies, or Rochdale pans, the only common feature being complaints of smells from the sewer ventilators. The sewers in Hanley appear to be very insufficiently flushed, and many of the waterclosets are without proper water-supply. Mr. Clare thinks that the prolonged heat and drought of last year brought into activity typhoid poison, which had been latent in the soil, and he points out that the present system of allowing clay joints to the drains considerably increases risk of soil pollution. Convictions were obtained against four persons for allowing their chimneys to emit black smoke beyond the prescribed limits.

Ormskirk Rural Sanitary District.—The difficulty in obtaining a site for a fever hospital is well illustrated in Dr. Herbert Peck's annual report for 1893. He states that no less than twelve sites were selected by the sub-committee appointed for the purpose, but that they were all objected to by persons in the neighbourhood. Dr. Peck remarks in reference to these efforts that "the one consolation we have is that we have done our best." It seems, however, that if eligible sites were to be abandoned because of local opposition that a large number of the fever hospitals in the country would never have been erected. Furthermore, in all cases where application is made to the Local Government Board for sanction for a loan to defray expenses, a local inquiry is held at which all those interested in the site in question have a right to state their objections, and all reasonable grounds of complaint receive due consideration. At the same time it certainly seems necessary that greater facilities should be given to sanitary authorities for acquiring land for hospital purposes.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN thirty-three of the largest English towns 5307 births and 3426 deaths were registered during the week ending May 19th. The annual rate of mortality in these towns, which had been 17·2 and 18·2 per 1000 in the preceding two weeks, declined again last week to 17·1. In London the rate was 17·5 per 1000, while it averaged 16·8 in the thirty-two provincial towns. The lowest rates in these towns were 7·9 in Croydon, 9·5 in Portsmouth, 12·7 in Derby, 13·0 in Leicester, and 13·4 in Sunderland; the highest rates were 20·1 in Nottingham, 20·8 in Wolverhampton, 21·8 in Salford and in Liverpool, and 22·2 in Norwich. The 3426 deaths included 550 which were referred to the principal zymotic diseases, against 546 and 585 in the preceding two weeks; of these, 257 resulted from measles, 112 from whooping-cough, 72 from diphtheria, 37 from scarlet fever, 37 from diarrhœa, 22 from "fever" (principally enteric), and 13 from small-pox. No fatal case of any of these diseases occurred last week in Gateshead; in the other towns they caused the lowest death-rates in Brighton, Bolton, Derby, and Burnley, and the highest rates in London, West Ham, Nottingham, and Birmingham. The greatest mortality from measles occurred in Leicester, London, Halifax, Nottingham, West Ham, and Birmingham; and from whooping-cough in Bristol, Nottingham, Plymouth, and Cardiff. The mortality from scarlet fever and from "fever" showed no marked excess in any of the thirty-three towns. The 72 deaths from diphtheria included 56 in London, 3 in Leeds, 2 in Liverpool, and 2 in Hull. Three fatal cases of small-pox were registered in London, 3 in West Ham, 3 in Birmingham, 2 in Manchester, and 1 each in Wolverhampton and in Oldham, but not one in any other of the thirty-three towns. There were 219 cases of small-pox under treatment in the Metropolitan Asylum Hospitals and in the Highgate Small-pox Hospital on Saturday last, May 19th, against 151, 191, and 210 at the end of the preceding three weeks; 52 new cases were admitted during the week, against 44, 64, and 71 in the preceding three weeks. The number of scarlet fever patients in the Metropolitan Asylum Hospitals and in the London Fever Hospital at the end of the week was 2307, against 2258, 2293, and 2298 on the preceding three Saturdays; 252 new cases were admitted during the week, against 268 and 282 in the preceding two weeks. The deaths referred to diseases of the respiratory organs in London, which had been 237 and 272 in the preceding two weeks, declined again to 234 last week, and were 102 below the corrected average. The causes of 54, or 1·6 per cent., of the deaths in the thirty-three towns were not certified, either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Oldham, Blackburn, Bradford, Sunderland, Newcastle-on-Tyne, and in nine other smaller towns; the largest proportions of uncertified deaths were registered in Cardiff, Birmingham, Halifax, and Huddersfield.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 20·1 and 19·8 per 1000 in the preceding two weeks, further declined to 17·4 during the week ending May 19th, but slightly exceeded the mean rate during the same period in the large English towns. The rates in the eight Scotch towns ranged from 14·8 in Paisley and 15·0 in Aberdeen and in Greenock to 18·9 in Perth and 20·6 in Dundee. The 497 deaths in these towns included 26 which were referred to whooping-cough, 8 to diphtheria, 7 to "fever," 6 to scarlet fever, 5 to measles, 5 to diarrhœa, and 3 to small-pox. In all, 60 deaths resulted from these principal zymotic diseases, against 77 and 82 in the preceding two weeks. These 60 deaths were equal to an annual rate of 2·1 per 1000, which was 0·6 below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of whooping-cough, which had been 40 and 39 in the preceding two weeks, further declined to 26 last week, of which 11 occurred in Glasgow, 6 in Dundee, and 4 in Edinburgh. The deaths from diphtheria, which had declined from 14 to 9 in the preceding two weeks, further fell to 8 last week, and included 3 in Glasgow. The 7 deaths referred to different forms of "fever" corresponded with the number in the preceding week, and included 2 in Edinburgh and 2 in Dundee. The fatal cases of scarlet fever, which had increased from 3 to 9 in the preceding four weeks, declined again to 6 last week, of which 3 occurred in Glasgow and 3 in Edinburgh. Of the 3 deaths from small-pox 2 were recorded in Edinburgh and 1 in Leith. The deaths referred to diseases of the respiratory organs in these towns, which had been 95 and 110 in the preceding two weeks, declined to 89 last week

and were 33 below the number in the corresponding week of last year. The causes of 23, or nearly 5 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 24·6 and 20·3 per 1000 in the preceding two weeks, rose again to 25·8 during the week ending May 19th. During the past seven weeks of the current quarter the death-rate in the city has averaged 23·8 per 1000, against 18·3 in London and 17·6 in Edinburgh. The 173 deaths registered in Dublin during the week under notice showed an increase of 37 upon the number in the preceding week, and included 16 which were referred to the principal zymotic diseases, against 9 and 12 in the preceding two weeks; of these, 5 resulted from whooping-cough, 5 from "fever," 3 from diarrhœa, 2 from diphtheria, 1 from scarlet fever, and not one either from small-pox or measles. These 16 deaths were equal to an annual rate of 2·4 per 1000, the zymotic death-rate during the same period being 3·9 in London and 2·7 in Edinburgh. The fatal cases of whooping-cough, which had been 3 and 8 in the preceding two weeks, declined again to 5 last week. The deaths referred to different forms of "fever," which had been 3 and 1 in the preceding two weeks, rose to 5 last week. The 2 deaths referred to diphtheria exceeded the number in any week since February last. The 173 deaths in Dublin last week included 33 of infants under one year of age and 40 of persons aged upwards of sixty years; the deaths both of infants and elderly persons considerably exceeded those recorded in recent weeks. Three inquest cases and 1 death from violence were registered; and 64, or more than a third, of the deaths occurred in public institutions. The causes of 21, or more than 12 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

MOVEMENTS OF THE MEDICAL STAFF.

SURGEON-CAPTAINS Russell and Donegan have arrived in the *Malabar* from India on completion of a tour of service, and Surgeon-Major Morgan has arrived from the West Coast of Africa. Surgeon-Major Dick has been posted to the North-Western District. The following officers from the South-Eastern District have proceeded to Aldershot for duty with the mobilised Bearer Companies:—Surgeon-Lieutenant-Colonel Saunders, Surgeon-Captain Macleod, and Surgeon-Lieutenant Chambers.

INDIA AND THE INDIAN MEDICAL SERVICE.

The following appointments are announced: Surgeon-Captain Smith, to the Medical Charge of the 3rd Bombay Light Cavalry. Surgeon-Lieutenant W. C. Sprague, M.D., to act as Medical Officer to the Kathiawar Political Agency and in Charge of the West Hospital, Rajkot, in addition to his military duties, pending relief by Surgeon-Captain H. Herbert, who will remain at Kaira until relieved. Surgeon-Major R. W. S. Lyons, M.D, is appointed to act as Civil Surgeon, Ratnagiri. Surgeon-Colonel D. O'Connell Raye, M.D., I.M.S. (Bengal), Principal Medical Officer, Bundelkhand and Nerbudda District, is appointed to officiate as Inspector-General of Civil Hospitals, Punjab, for eight months. Surgeon-Captain J. R. Roberts, I.M.S. (Bengal), is confirmed in the appointment of Agency Surgeon at Gilgit. Surgeon-Captain C. E. Sunder, Officiating Civil Surgeon of Purnea, to act as a Resident Medical Officer of the Medical College Hospital, Calcutta. Surgeon-Captain C. R. M. Green, Officiating Resident Surgeon, Eden Hospital, Calcutta, to act as Civil Surgeon of Purnea until further orders. Surgeon-Major Ferguson, on reversion to military duty, is posted to general duty, Sind District. Surgeon-Lieutenant Bennett is brought on the strength of the Bombay Medical Establishment. The services of Surgeon-Captain M. A. Ker, I.M.S. (Bengal), are replaced temporarily at the disposal of the Military Department. Surgeon-Colonel J. Richardson, Inspector-General, Civil Hospitals, North-West Provinces, retires from the Service. The Queen's approval of the following promotions among the Officers of the Indian Medical Service made by the Government in India appears in the *London Gazette* of May 22nd:—*Bengal Medical Establishment:* Brigade-Surgeon-Lieutenant-Colonels to be Surgeon-Colonels: George Cumberland Ross and William Pleace Warburton, M.D. Surgeon-Lieutenant-Colonels to be Brigade-Surgeon-Lieutenant-Colonels: Richard Careless Sanders, M.D., Benjamin Franklin, Robert Temple Wright, M.D., and George McBride Davis, M.D. The Queen has also approved of the retirement from the Service of the undermentioned Officers:—*Bengal Medical Establishment:* Surgeon-Colonel George Cochet Chesnaye and Surgeon-Colonel John Richardson.

NAVAL MEDICAL SERVICE.

Fleet-Surgeon Robert Hay, M.D., has been promoted to the rank of Deputy-Inspector-General of Hospitals and Fleets in Her Majesty's Fleet. Fleet-Surgeon Alfred William Whiteley is placed on the Retired List, with permission to assume the rank of Deputy-Inspector-General of Hospitals and Fleets.

The following appointments are notified:—Surgeons: Frederick J. Lilley, to the Portsmouth Division (Royal Marines); Edgar R. Dinsey, to the *Barrosa*, and M. L. B. Rodd, to the *Endymion*.

The undermentioned gentlemen, who competed on the 7th inst. and following days at the Examination Hall, Victoria Embankment, for appointments as Surgeon in the Royal Navy, have been granted commissions:—

Name.	Marks.	Name.	Marks.
F. E. Rock, M.B. ..	2854	T. W. Philip, M.A., M.B.	2224
T. T. Jeans, M.B. ..	2635	R. S. Bernard	2214
N. J. Smith	2547	L. Kilroy	2211
R. A. Kirby, B.A. ..	2527	F. J. Barter, B.A., M.B.	2144
J. H. Pead, B.A.	2466	J. Mowat, M.B.	2142
G. R. MacMahon, B.A., M.B.	2381	S. H. Birt	2138
R. T. Gilmour	2378	M. H. Knapp	2122
H. C. Arachoon	2356	R. D. Jameson	2111
B. G. Heather	2259	H. S. Burniston, M.B.	2096
L. E. James	2256	A. A. J. McNabb, M.B.	2076

VOLUNTEER CORPS.

Rifle: 1st Volunteer Battalion, the Queen's (Royal West Surrey Regiment): Surgeon-Captain G. J. Eady, M.D., resigns his commission.—*Royal Engineers:* 2nd (the Weald of Kent) Volunteer Battalion, the Buffs (East Kent Regiment): Surgeon-Major W. M. Harmer resigns his commission; also is permitted to retain his rank, and to continue to wear the uniform of the Battalion on his retirement.—2nd Volunteer Battalion, the Lincolnshire Regiment: Honorary Assistant Surgeon R. Wilson resigns his commission.—2nd Volunteer Battalion, the Queen's Own (Royal West Kent Regiment): Surgeon-Captain D. T. Playfair, M.D., resigns his commission.—2nd Volunteer Battalion, the Manchester Regiment: Surgeon-Lieutenant H. Gould resigns his commission.—1st Volunteer Battalion, the Prince of Wales's (North Staffordshire Regiment): Surgeon-Captain J. F. Arlidge, from the 3rd Volunteer Battalion, the West Riding Regiment, to be Surgeon-Captain.—1st Sutherland (the Sutherland Highland): Samuel Elliot, M.B., to be Surgeon-Lieutenant.—24th Middlesex: Surgeon-Lieutenant C. D. Grant to be Surgeon-Captain.

VOLUNTEER INFANTRY BRIGADE.

South of Scotland Brigade: Surgeon-Lieutenant-Colonel G. H. Turnbull, M.D., 1st Roxburgh and Selkirk (the Border) Volunteer Rifle Corps, to be Brigade-Surgeon-Lieutenant-Colonel.

FIELD HOSPITAL EXERCISES.

That the medical officers of the army and the men of the Medical Staff Corps should have every opportunity of rehearsing in times of peace the work and duties which will devolve upon them in the field in time of war is plainly a matter of common sense, and yet the army has only just set about doing it. We understand, however, that the Duke of Connaught and the military authorities at Aldershot are desirous of placing every facility in the way of the medical service for carrying out their work in this direction during the forthcoming military manœuvres. So far the mobilisation of the two bearer companies and two field hospitals with detachments of the Medical Staff Corps is said to have proved very successful, and their work is attracting a good deal of attention. It is a good movement, and quite in the right direction, and we hope to see it extended hereafter.

HEALTH OF THE TROOPS AT ALDERSHOT.

According to a paragraph in the naval and military intelligence of *The Times*, the Duke of Connaught states, in a report to headquarters, that the general health of the troops under his command has been satisfactory. The number of men for whom hospital accommodation is required remains constant—i.e., 5 per cent. of strength—but this does not

include a considerable number of men detained for the day. The death-rate, apart from suicide, accidents, and sudden deaths out of hospital, was 3·23 per 1000 of strength. During the twelve months taken for comparison there was an epidemic of scarlet fever, 284 men having been attacked with that disease, and 5 cases terminated fatally. There were at one time as many as 119 cases under treatment.

VOLUNTEERS AT NETLEY.

The Manchester companies of the Volunteer Medical Staff Corps, under the command of Surgeon-Captain W. Coates, left Netley on Saturday, the 19th. During the week they daily paraded for waggon, stretcher, and company drill, and had opportunities of training at the Royal Victoria Hospital and in the arrangement of camps. On Friday, the 18th, they were inspected by Surgeon-Major-General Broke-Smith, Principal Medical Officer, Netley.

The Commander-in-Chief has lately decided that the Professors of the Army Medical School who are on the Active List shall be considered Extra Regimental Officers under Paragraph 55 (i) of the Pay Warrant. Brigade-Surgeon-Lieutenant-Colonel Stevenson, Professor of Military Surgery, has therefore handed over charge of the Surgical Division of the Royal Victoria Hospital, Netley, to the Assistant Professor, Surgeon-Captain H. Whitehead, F.R.C.S.

Correspondence.

"Audi alteram partem."

"NOTIFICATION: A MISCARRIAGE OF JUSTICE."

To the Editors of THE LANCET.

SIRS,—Will you allow me to clear up the imperfect report and to point the moral in the tale of notification to which you allude in THE LANCET of May 19th? On Feb. 1st I was called to see a case of typhoid fever, which I reported on Feb. 3rd to the medical officer of health at St. Ermin's-mansions, taking the address from the Beckenham Directory. The case died in relapse, and the certificate of death is said by the local board to be the first intimation received of the infectious disease. I hold that the failure of notification was due to the carelessness of the local board, which allows the local directory for 1894 to appear with the address of the medical officer of health as St. Ermin's-mansions when the London Directory shows that he left that address in 1892. Also that the board, although they knew in 1892 that I was in error as to their district and without their notification forms, neither communicated with me nor sent me a book of forms till just before these proceedings were commenced. After the sentence was passed I found the counterfoil of the case showing that I had complied with the Act, and this was produced by counsel in court at the next meeting of the magistrates. One point to which I would direct attention is this: should the onus of ascertaining the district lie upon the medical attendant? Close to the top of the Crystal Palace Park-road are four districts, and it would be a distinct improvement in the working of the Act to allow the medical attendant to report to his local medical officer of health and let the local authorities forward the report to its proper destination. I am advised that no chance of quashing the sentence exists unless I could prove the posting of the notification. Is this likely after three months? Does it not concern the inflictor quite as much as the victim of injustice to correct this defect in the law? The practical lessons of the decision are: 1. Care in retaining counterfoils and in noting upon them the date and mode of posting so as to be sworn to. The bench of magistrates have as superstitious a reverence for sworn statements as the old boards of guardians had for parchment. 2. Never go into court without legal advice. 3. Let us be more backward in promoting legislation affecting our profession till we know that the administration will be entrusted to judicious and competent hands. In defending myself in court, on the principle of sally, I attacked the local board in that, during a four years' existence of this Act, they had not prosecuted any local medical man, but took the opportunity offered by the supposed failure of a non-resident to earn a cheap reputation for activity. This was represented as an attack upon the medical practitioners at Beckenham. It was not so, and nothing was further from my intention than to make any statement reflecting upon them. Their local board was a different matter, and the warmth of reception which my suggestion met with from its clerk made me think that I had hit the right solution of the motive in pressing conviction in my case.

I am, Sirs, your obedient servant,

JOHN H. GALTON, M.D. Lond.

Sylvan-road, Norwood, S.E., May 21st, 1894.

MORBID GROWTHS AND SPOROZOA.

To the Editors of THE LANCET.

SIRS,—I notice in the abstract of the Morton Lecture, published in THE LANCET of May 19th, Mr. S. G. Shattock emphasises the importance of certain cell-inclusions presenting a well-marked "peripheral granule layer" occurring in cancerous growths. I may be permitted to point out that I was the first in this country to publish[1] an account of such bodies, and to point out their signification.

Believe me, Sirs, yours truly,

J. JACKSON CLARKE.

St. Mary's Hospital Medical School, May 19th, 1894.

CASE OF SYNCOPE (?) UNDER CHLOROFORM.

To the Editors of THE LANCET.

SIRS,—This case occurred in the operating theatre of the Western Infirmary, Glasgow, in the practice of Dr. H. C. Cameron, with whose kind permission I publish it. The patient was a female twenty-four years of age, and the operation was to open a cold abscess over the sternum. The anæsthetist administered chloroform freely for exactly three minutes and a half and gave none for the next minute, when he again administered a small quantity, and this he repeated a few times afterwards. The breathing was not stertorous when the inhalation was left off at first, but became so half a minute afterwards. Just as the operation was being finished, and about six minutes from the beginning of the inhalation, I observed the patient take some deep, almost heaving inspirations for about half a minute. The breathing then became slow and shallow, and on now taking the patient by the wrist it was found that the pulse was very slow, irregular, and scarcely perceptible. On applying the stethoscope over the heart the beats were excessively slow and barely audible. The lips were pale and bloodless, and the face and ears of a dusky hue. The foot of the table was elevated, and the colour of the lips and the action of the heart improved within a minute, and the patient was soon quite well. Before and after the state of the circulation above described she was very sick. The symptoms in this case seem to have been as grave as those recorded in many cases in which artificial respiration was resorted to. The points deserving attention are the following. The anæsthesia was never of the deepest, and the heaving respiration and subsequent phenomena occurred after the chloroform was finally stopped. The state of the respiration was the very same as I have observed in cats and dogs when taken out of a jar of chloroform; the deep and rapid breathing in the latter sometimes renders the vesicular murmur so loud that it may almost be described as "churning." This state of breathing is followed in dogs, as it was in this patient, by slow and shallow inspirations due to the state of apnœa induced by the previous excess of the respiratory function. Excessive respiration has been observed by others to be a precursor of danger under chloroform, for Dr. Turnbull of Philadelphia has observed that "when the breathing becomes very rapid danger is nigh," and heaving respiration has frequently been recorded in cases of fatal syncope. With regard to the circulation, the cardiac action was closely analogous to what I have described in cats when taken out of a chloroform atmosphere, and may also be compared with that remarkable retardation of the heart described by the Glasgow Committee as occurring in a dog two minutes after the chloroform was stopped, and coincidently with which there ensued a sudden fall of pressure to zero.

[1] Medical Press and Circular, Sept. 27th, 1893.

Dr. Snow observed that the pulse sometimes became very slow as the effects of the chloroform were passing off; and at a recent discussion at Sheffield Dr. Martin remarked that he had occasionally noted a slow and irregular pulse under chloroform, and that he regarded it as dangerous. Indeed, it has been recorded in connexion with fatal syncope in some cases. Now, I regard the evidence as being conclusive that the train of events above recorded is the result of the vapour reaction, and is not due to the action of absorbed chloroform in the blood. From considerations of space I would venture only one further remark. It has now been shown that the heart may fail to carry on the circulation because it is liable to fall into an irregular action, in which there occur powerful fibrillar contractions, but incoördinated and ineffective. The reasons for supposing that this is the case in chloroform syncope seem to me very cogent; and if so—and if, further, this condition is preceded by excess of the respiratory function—then the propriety of artificial respiration in its treatment becomes an open question. With all deference I submit that the suspicions I had been led to entertain with regard to it twenty years ago have only gained strength as time went on; and I am disposed to think the chloroformist would do better to lower the head and wait for a few minutes rather than have recourse to it.—I am, Sirs, yours faithfully,

ROBERT KIRK, M.D. Edin.,
May 12th, 1894. Dispensary Physician, Glasgow Western Infirmary.

METROPOLITAN HOSPITAL SUNDAY FUND.

To the Editors of THE LANCET.

SIRS,—I am in receipt of your favour of the 12th inst. I am very anxious to make Hospital Sunday a success this year and have written a special circular to be sent to all my London congregations.—I am, Sirs, yours truly,

Brynmawr, May 15th, 1894. H. ADLER.

The following is the circular letter which has been issued by the Chief Rabbi to all his London congregations:—

"22, Finsbury-square,
"London, May 23rd, 5654.

"MY DEAR SIR,—I beg to inform you that this year's 'Hospital Sunday' has been fixed for June 10th. As this date coincides with the first day of שבועות, I deem it advisable that we should on this occasion, for the first time in the history of the Fund, plead the needs of the hospitals on the same day as the rest of our fellow citizens.

"I therefore recommend that a circular letter be sent before that date to every seatholder of your synagogue, soliciting his donation to the Metropolitan Hospital Sunday Fund, and enclosing a form to be filled up by him with his name and the amount of his contribution. Your minister will, I am sure, in his sermon advocate with fervour the cause of the medical charities, and stimulate his congregants to support them in a spirit of benevolence worthy of the law of love and mercy revealed on that sacred festival. And I hope that the community will respond to that appeal with their usual alacrity.

"May I ask that your secretary will promptly collect the amounts subscribed and forward them to me, *not later than a fortnight after Hospital Sunday*, for transmission to the Lord Mayor, the Treasurer of the Fund.

"Wishing you a happy festival,
"I remain, my dear Sir,
"Yours very faithfully,
"H. ADLER.

"The Order of Service on the occasion of making collections for hospitals is printed on page 311 of the Authorised Daily Prayer Book."

"THE ANTISEPTIC DOCTRINE OF MIDWIFERY."

To the Editors of THE LANCET.

SIRS,—In connexion with the practical application of the above-named doctrine there is a point to which sufficient attention is not given, and that is the material of which the vaginal pipe of the irrigating apparatus is made. Nothing can possibly be more unsuitable than the ordinary gum-elastic vaginal pipe, as it is impossible to be sure that it is perfectly clean while its perforated ending may conceal unspeakable putridity. Would it not be advisable to draw the attention of the makers of such irrigating apparatus to this objectionable feature, with a view to the substitution of a glass vaginal tube, the cleanliness of which can be tested by ocular inspection as well as ensured by its immersion in some strong antiseptic fluid?

I am, Sirs, yours faithfully,
Watton, Norfolk, May 14th, 1894. H. MALLINS, M.B. Dubl.

THE USE OF THE TOES.

To the Editors of THE LANCET.

SIRS,—Professor Sir G. M. Humphry, in THE LANCET of May 19th, states that "they (the toes) are laid up in leather and not used." May I ask of him a question already asked of Mr. Clement Lucas[1] in reply to a similar statement, How is it, then, that the muscles of the sole and of the leg, which act on the toes, do not atrophy for want of use? I have long insisted that, even in ordinary walking in ordinary boots, the toes, and all of them, are used and serve a very useful purpose.

I am, Sirs, yours truly,
Gloucester, May 22nd, 1894. T. S. ELLIS.

"LOCAL GOVERNMENT ACT, 1894: ARE DISTRICT MEDICAL OFFICERS QUALIFIED TO BE ELECTED MEMBERS OF A PARISH?"

To the Editors of THE LANCET.

SIRS,—As I do not remember seeing any comment or opinion on the letter from a correspondent in THE LANCET of March 24th concerning the eligibility of medical officers of parishes to serve as parish councillors, I forward you a copy of a letter received by me from the Local Government Board. I am, Sirs, yours faithfully,

C. STANLEY KIRTON.

The Oriel House, Leigh, Essex, May 15th, 1894.

"Local Government Board, Whitehall, S.W., May 10th, 1894.

"Sir,—I am directed by the Local Government Board to advert to your letter of the 24th ultimo, and to state that your office of district medical officer to the board of guardians will not, in the opinion of this Board, disqualify you for election as a parish councillor.

"I am, Sir, your obedient servant,
"S. B. PROVIS, Assistant Secretary.

"C. S. Kirton, Esq., The Oriel House, Leigh, Essex."

THE MEDICAL DEFENCE UNION.

To the Editors of THE LANCET.

SIRS,—In reference to your report of the recent meeting of the Medical Defence Union and Dr. Phillips' explanation that he did not inform Dr. Kerr (as I understood from that gentleman's letter and conversation) that litigation was finished, will you permit me to add that, upon Dr. Kerr stating to the meeting that he did not remember who it was, but thought it was not Dr. Phillips, who so misinformed him, I of course withdrew my statement on the point?

I am, Sirs, yours faithfully,
Cavendish-square, W., May 22nd, 1894. VICTOR HORSLEY.

"ACTION AGAINST A LIVERPOOL DENTIST."

To the Editors of THE LANCET.

SIRS,—Your report of the action against a Liverpool dentist, with your comments thereon, appearing in your issue of May 12th, came under my notice only on May 20th. The last sentence in the article reads: "For a medical man to permit an unqualified person to give chloroform for him is to promote 'covering' of the most dangerous description." This is a very grave charge to bring against me, more especially when there is not a particle of truth in it, as I proceed to show. My relations with the defendant, or rather with his assistant, have been of two kinds. I have attended him and his family for several years and I have occasionally administered chloroform or ether when requested to do so. Beyond this I have no interest, pecuniary or other, in the defendant or in his business. I did not teach Mr. Harrison

[1] THE LANCET, March 19th, 1892.

to use the stethoscope nor did I give him instruction in the diseases of the heart. I may add that the recommendations, amounting to two or at most three, were for the extraction of a certain definite number of decayed teeth. Mr. Matthews, the dentist called for the plaintiff, stated that his fees for extraction were one guinea a tooth and that the lowest figure at which he could supply a set to anyone in the position of the plaintiff—a nurse-girl receiving £12 or £14 a year—was twenty-five guineas. Unfortunately all my patients cannot afford to pay such fees. In recommending a dentist a medical man has to consider the means of his patients, and to send many of them to those who will, he believes, do good work at a reasonable charge. As for the case which formed the subject of the trial I knew nothing of it until the evening of the day on which the trial began. I never saw the plaintiff until her cross-examination was almost finished. I appeared in the witness-box to state—what I am prepared to reaffirm—that Mr. Harrison is a careful and skilful operator, and to express my belief that he was incapable of doing what was alleged against him. As to the merits of the particular case, I was not in a position, nor did it concern me, to say anything. My examination and cross-examination were very brief. I was not even questioned on the statement of the dentist called for the plaintiff, who swore that he was able, by an examination of the mouth two months after the extraction of the teeth, positively to assert that only two of the teeth removed were unsound. You will thus see that you have brought against me an entirely unfounded charge of promoting "covering." Your sense of justice and fairness will, I feel confident, induce you at once to withdraw the accusation and to apologise for making it.

I am, Sirs, yours faithfully,

Liverpool, May 22nd, 1894. H. A. CLARKE.

*** It must be seen, we are certain, by every reader that the words in our article upon the action against a Liverpool dentist, to which Dr. H. A. Clarke takes exception, contained no personal reflection whatever upon him. They were not intended to apply to him, and, as written, do not apply to him. They were and are a general expression of opinion the soundness of which is unimpeachable.—ED. L.

"CHILDREN'S EYESIGHT."

To the Editors of THE LANCET.

SIRS,—An error occurs in your report of my remarks at the last meeting of the Ophthalmological Society in THE LANCET of May 19th. I did not speak of the difficulty of obtaining examinations in schools owing to the want of appreciation on the part of the teachers, but, on the other hand, I referred to the increasing interest which teachers displayed, in my experience, in the question of the children's eyesight.

I shall be obliged if you will kindly insert this correction.

I am, Sirs, yours faithfully,

Sheffield, May 21st, 1894. SIMEON SNELL.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

The Botanical Gardens.

THE Whitsuntide Flower Show in the gardens at Old Trafford is always looked forward to with interest not only by Manchester people fond of flowers, but by horticulturists in all parts of the country. It is open the whole week, and this year has more than sustained its reputation. For very many years the late Dr. Ainsworth was wont to exhibit orchids showing great beauty and vigour, though grown within a couple of miles from the Manchester Exchange. The gardens themselves, though so close to a populous district, still maintain their beauty, and are now, perhaps, seen at their best while the fresh young foliage of the trees and shrubs is as yet unsullied by the smoke which before long will destroy much of its charm. The opening was made the occasion of the presentation of an address and a service of plate to Mr. Bruce Findlay, curator of the gardens for thirty-five years, whose great services, not only to Manchester, but to the development of horticulture through the United Kingdom, have thus been deservedly acknowledged. The Dean of Rochester—perhaps better known as Canon Hole—in the course of his speech, said he preferred this development in the culture of fruit and flowers to that of the neighbouring Ship Canal, and questioned even if they went down to the canal they would find anything brighter or sweeter-smelling than they had in the gardens. The smell from the canal, by the way, has been much lessened by the recent rains. It is to be feared that its proximity and the probable multiplication of works of various kinds bode no good to the gardens. The preservation of their beauty is becoming increasingly difficult, for vegetation is always worsted in the struggle against smoke and noxious vapours. In the meantime they still form one of the most valuable of the "lungs" of Manchester. Whitworth Park, in Oxford-road, on the south side of the city, has been recently added to the open spaces, and should have been named in a former communication. It contains numerous well grown trees, is attractively laid out, bright with flowers, and is much frequented by the large population living within a short distance.

Manchester Paupers.

The budget presented by the clerk to the guardians is of interest not only as showing the money cost of pauperism, but as indicating in some measure the social condition of a large section of the community. The estimate for last year was exceeded by £3000; this is explained by an increase in the number relieved, an improved dietary for the inmates, and extra cost of fuel owing to the coal strike. This year it is expected there will be more cases for relief; but coal is cheaper, and "the materials used in breadmaking have reached the lowest price on record." "The gross expenditure for the current year is put down at £69,815, of which £48,000 must come from the rates." The remainder comes from other sources, nearly £20,000 being a payment under the Local Government Act in relief of rates. The expenditure per week per head of the inmates is estimated at 3*s.* 5½*d.*, which cannot be called extravagant. It had been anticipated that the demolition of old property, the railway extensions and street improvements would have led to an exodus from the Manchester township of the classes on the verge of pauperism from which the paupers are recruited; but it is not so. Those who leave are the better sort of poor, while the worst and the lowest remain in low lodging-houses, which are increasing in number to supply the demand. From these they drift into the workhouse as soon as they are ill or in want. Last year £479 above the estimates was spent in the maintenance of lunatics, and this year a further increase is provided for. As reported in the *City News* of March 31st, Dr. Rhodes, chairman of the Chorlton Board, said there was a large increase of lunacy all over the country, his opinion being that bad feeding, insanitary dwellings, and drunkenness were among the causes. No doubt; but is the feeding worse, are the dwellings more insanitary, and is drunkenness greater than in days gone by? The Chorlton Board spent £14,000 last year, against £9000 in 1890, in the maintenance of lunatics. If this may be taken as an indication of what is going on through the country, the prospect is grave. The struggle for existence becomes keener day by day, and while the present generation is perhaps quicker and more mentally alive—more nervously susceptible—than the preceding one, its physical vigour in our large towns is certainly less.

The Queen's Visit.

Her Majesty's visit to Manchester and Salford yesterday for the official opening of the Ship Canal is chronicled with much detail in this morning's papers. She passed through several of the principal streets in Manchester and also through a considerable part of Salford. On her arrival at Trafford Wharf she went on board the *Enchantress*, and took her seat on a raised platform at the stern of the boat. Here an address was presented to Her Majesty by Lord Egerton (the chairman) from the directors of the company, who were then presented to the Queen, as also were the engineer, Mr. Leader Williams; the manager, Mr. Marshall Stevens; and the secretary, Mr. Whitworth. The Lord Mayor of Manchester and the Mayor of Salford were then summoned, and both received the honour of knighthood. "Taking the sword of Sir John McNeill the Queen lightly touched the shoulder of Mr. Marshall, and he rose Sir Anthony." The anticipations of last week were not fulfilled, for after these ceremonies were over the *Enchantress* went down to the Mode Wheel Locks. Here "electric communication with the centre of one of the piers was established, the Queen pressed a button, and the gates began to

open." She then declared the Ship Canal open. The concourse of people all along the whole of the route was enormous, every window, even the roofs of the highest buildings, as well as the roadways, being crowded with people. Some have estimated the number at 1,000,000. Even if this estimate is too high, the crowd was impressive from its vastness, while its enthusiasm and loyalty were abundantly evident. The Queen expressed to the Lord Mayor her gratification with the warmth of the welcome she had received and with the decorations so liberally displayed all along the route. The crowd was good-humoured, patient, and well-behaved, and, notwithstanding the pressure, few accidents seem to have occurred. One young girl, however, was injured by the pressure of the crowd and taken to the infirmary. Two people were run over, but not seriously hurt; a woman had her leg brôken from the fall of a stand; and in the evening a mother and her child were killed by the fall of a heavy stone from a fourth-storey window. The marvel is that many more accidents did not occur. The recent rains had done wonders in improving the condition of the water, and so far I have heard no complaints of its being offensive.

May 22nd.

NORTHERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENT.)

Accidents in Northern Coal Mines.

THE recently issued report of Mr. J. L. Hedley, Her Majesty's Inspector of Mines in the Newcastle district, comprising the north part of the county of Durham and the counties of Cumberland and Northumberland, as to accidents during the past year, shows the loss of 86 lives, while 312 persons have been injured. These figures show an increase of 13 in the number of fatal accidents and of 44 in the number of the injured. It should be noted, however, that 7 of the deaths resulted from injuries received in the year 1892, and of this number 5 were somewhat doubtfully accounted for. This might be said of 5 other deaths, making a total of 10, about which it was uncertain how the fatal injuries had been received. Two deaths resulted from an explosion of fire-damp, 47 from falls of roof and side of excavations, and 10 in shafts; 22 deaths followed miscellaneous causes underground, and 5 occurred on the surface. Although the number of fatal accidents and deaths resulting therefrom were so much in excess of the previous year, it is satisfactory to note that the quantity of mineral raised per life lost is not far behind that for 1892, the figures being 235,358 tons and 248,345 tons respectively, or a decrease of 12,987 tons. On the other hand, there has been a considerable decrease in the number of men employed per life lost; but this is accounted for by the fact that there was a strike of three months' duration in 1892 in the Durham portion of the district and a consequent diminution in the number of accidents.

Telephones in Workhouses.

A Newcastle guardian suggested that a telephone should be established in the centre of the town for the convenience of poor people who wished to inquire after their sick friends at the Workhouse Infirmary. He instanced the case of a poor woman, who knew nothing of the death of a relative until a considerable time after the occurrence, as an argument for the usefulness and the humanity of the innovation. I am glad to state that this useful suggestion was adopted.

Darlington Queen's Nurses Association.

On Sunday afternoon, May 20th, there was an immense assemblage in Darlington Park, the occasion being a sacred concert by the united choirs of the town. A collection was made on behalf of the Queen's Nurses Association.

Penrith Water-supply.

The Local Government Board have just published an important report by Dr. Bruce Low, one of their medical inspectors, upon his recent examination of the Penrith water-supply. For several years past the local Board of Health have discussed various schemes for improvements, but hitherto have been hopelessly divided between the present scheme of pumping from the river Eamont, which flows from Ullswater Lake, and going to the Melmerby section of the Cross Fell Range for a gravitation supply. Dr. Bruce Low, in concluding his report, says: "In my view the town of Penrith is, under present conditions, at all times liable to be attacked by epidemic disease such as can be conveyed by water, as, for instance, enteric fever and cholera, and the sooner the urban sanitary authority can be brought to recognise this fact the better will it be for the inhabitants of the place."

Death of Mr. Gilbert Ward, F.R.C.S. Eng., of Blyth.

Mr. Gilbert Ward died last Thursday at his residence, Blyth, after a short illness, in his ninetieth year. Mr. Ward, as well as being the oldest surgeon in the north, having first qualified in 1828, was well known as a public man, having filled various offices in Blyth and helped very much to develop its capabilities as a seaport. Mr. Ward notably distinguished himself in the cholera visitations, and also during the terrible Hartley colliery accident in 1860. He was an active promoter of the Knight Memorial Hospital at Blyth. He received decorations from the Emperor Napoleon and the King of Italy.

Newcastle-on-Tyne, May 23rd.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Sir Joseph Lister in Glasgow.

UNDOUBTEDLY the event of the past week was the visit of Sir Joseph Lister to the scene of his early triumphs in antiseptic surgery—to Glasgow and the wards of its old Royal Infirmary. To return after an absence of nearly a quarter of a century, to be met by many of his old infirmary and university colleagues, to be surrounded again by a host of his old pupils, and to stand once more face to face with an eager, critical, but appreciative and enthusiastic assemblage of Scottish medical students, must have been a pleasant experience for Sir Joseph Lister. There can be no doubt as to the warmth of his reception. No one who was privileged to hear his address to the students will ever forget the enthusiasm of his welcome, the attitude of strained and eager attention on the part of his audience, or the readiness with which all the speaker's points were appreciated. Professor George Buchanan spoke of his early experiences of the antiseptic system, and struck the nail fairly on the head when he drew a contrast between the "lucky hit" which led to the introduction of anæsthetics, and the steady, gradual, laborious, and truly scientific evolution of the Listerian theory and practice. Professor Gairdner also spoke, and with all his usual felicity. He was particularly happy when he claimed a share in the origination of "Listerism," going back to a conversation with Sir J. Lister, in the early "fifties," on the very different behaviour of an empyema, according as it bursts outwardly or inwardly; and he made a peculiarly good point, when speaking of Sir J. Lister's knack of absorbing facts and hints from every side, in characterising him as a "walking phagocyte." After the address the students became demonstrative again, sang "Auld Lang Syne" (in which Sir Joseph Lister and his old pupils joined with evident feeling), and finally, outside the University Union, unyoked the horse from his cab and dragged the conveyance, amidst deafening cheers, from the University to Dr. Hector C. Cameron's house, a distance of over a mile. The distance was covered in a remarkably short space of time, and probably Sir Joseph Lister and his companions in peril were glad when the journey was safely accomplished. Finally, on the steps of Dr. Cameron's house a few words were said, "Auld Lang Syne" again sung, and the most exciting part of the visit was over. The reception of old pupils and friends, held next day at Dr. Cameron's, was equally enjoyable though altogether a quieter function. Taking it altogether, it is scarcely possible to imagine a more hearty or more enthusiastic reception than that given to Sir Joseph Lister.

May 23rd.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Royal College of Surgeons in Ireland.

A MEETING of the Fellows will be held on June 2nd to receive the annual report of the council, and on June 4th a second meeting will be held to elect a president, vice-president, council, and secretary of the College for the ensuing year. Mr. Hamilton, the present president, will

retire, and will probably be succeeded by the vice-president, Mr. W. Thornley Stoker. Mr. William Thomson, surgeon to the Richmond Hospital, will be a candidate for the vice-presidency. Mr. Henry Sherlock, a well-known dentist, will be a candidate for council and will be well supported, and Mr. Auchinleck, physician to Mercer's Hospital, will also be a candidate.

Queen's College, Cork.

Mr. Justice Holmes, Dr. Walter Smith (President of the Royal College of Physicians), and Mr. Hamilton (President of the Royal College of Surgeons), visitors of the College, held an extraordinary visitation last week. The visitation was held in response to the memorial presented to the visitors by the members of the College council, with the exception of the president. The memorial referred to various acts of the president which were alleged to be not in accordance with the provisions of the College statutes and as interfering with the exercise by the members of the council of the powers in relation to the government and administration of the College conferred on them by the statutes. Evidence having been given relative to the various grounds of complaint, Mr. Justice Holmes delivered the decision of the visitors and said that of the many unfortunate differences that led to that visitation by far the most serious was the claim of the president to render inoperative, by refusing his signature, those resolutions of the council which he did not approve of. Theoretically this was a matter of great importance, and though the subjects in connexion with which the president sought to exercise this right had been of a most trivial nature it had doubtless a great deal to do with the other smaller matters which came before the visitors. It reflected credit on the tact and temper of the successive presidents and professors who had composed the councils of these institutions that during the half-century of their existence they had hitherto avoided any occasion for an appeal to the visitors on this question, and it was much to be regretted that, while points of importance might often have been amicably settled, the president had now for the first time in fifty years claimed to nullify the unanimous decision of his colleagues in reference to matters which in the opinion of the visitors were not worth five minutes' discussion. The claim of the president to have written statements of his inserted on the minutes could not be supported, as they could only be placed on the minutes by order of the council. Charges 8 and 9 were frivolous and should not have been made. In conclusion, the visitors impressed on the president and professors the necessity, in the true interests of the College, of the cultivation of more friendly and harmonious relations with each other. While giving them full credit for labouring for the prosperity of the College it was impossible to avoid coming to the conclusion that a spirit of hostility and recrimination had sprung up between them. Mutual confidences leading up to mutual concessions, respect for the opinions and prejudices of one another, and an earnest effort to avoid all causes of offence did not belong to all men by nature, but might be cultivated and developed, and it was to be hoped that one of the results of this visitation would be to make the members of the council more charitable and tolerant among themselves and thus make their deliberations more useful to the College committed to their care.

Health of Dublin for April.

During the past month the deaths from influenza declined nearly one half as compared with March, and the fatality due to whooping-cough showed a slight decrease. With the exception of April, 1890, the death-rate was lower than in any corresponding period during the previous ten years and was 4·21 below the mean rate for that period. The zymotic death-rate was 0·78 below the mean rate. Typhoid fever only caused 10, influenza 11, and whooping-cough 15 deaths.

Royal Hospital for Incurables.

The new pavilion is now all but completed, and the governors hope soon to announce that it is furnished and ready for the reception of forty-eight patients. It is intended to fill the beds gradually, according as pressing cases present themselves and funds permit. The pavilion has a southern aspect, and the upper ward will be kept for phthisical cases only. It is proposed that Ward No. 10 in the Victoria Jubilee wing, now occupied by women, shall be given to men. There will then be beds for 110 men and 119 women, instead of 75 and 107 respectively, as at present.

International Sanitary Congress.

The Medical Faculty of the Catholic University have nominated Professors Roche and McWeeney as delegates to the International Sanitary Congress, Budapest.

The late Mr. W. W. Leeper, M.D. Edin.

I have to announce the death at the age of seventy-two years of Dr. Leeper of Loughgall, co. Armagh, which occurred on May 16th. He had been at work up to Saturday, the 12th, when, while visiting a patient, he was seized with apoplexy. Dr. Leeper was well known in co. Armagh, and his opinion was very highly valued. He studied in Edinburgh and Dublin, graduating with honours, and obtained the gold medal with his M.D. in Edinburgh in 1844. He was for a time surgeon on the P. & O. steamers, but spent nearly all his professional life in Loughgall, where for forty-six years he was medical officer of the dispensary. He was buried on May 18th. Dr. Leeper was a man held in the highest respect both for his personal and professional qualities.

Killough Dispensary.

Dr. McComiskey, assistant medical officer in Down Infirmary, has been elected medical officer of the Killough Dispensary, co. Down, a post vacant through Mr. S. S. Stephenson's death.

Bequests to Medical Charities.

The late Mr. A. T. Macaulay, senior director of the Belfast Bank, has left £1000 to the Royal Hospital, £1000 to the Belfast Hospital for Sick Children, £1000 to the Ulster Hospital for Women and Children, £1000 to the Consumptive Hospital, and £1000 to the nurses for the sick poor.

May 22nd.

Obituary.

DIRK CLOETE, M.B., C.M. EDIN.,

WYNBERG, CAPE OF GOOD HOPE.

THE death of Dr. Dirk Cloete, which took place at Alphen, Wynberg, Cape of Good Hope, at noon, on April 9th, 1894, will not come as a surprise to those who knew his state of health. Dr. Cloete graduated at Edinburgh University in 1884, taking the degrees of M.B. and C.M., and then returned to the Cape and volunteered for Colonel Warren's expedition to Bechuanaland as a medical officer. He afterwards settled down at Pretoria, in the Transvaal, where he became very popular among a large circle of friends. Unfortunately he contracted fever there, and in consequence of the ill-health occasioned he removed to Wynberg, in the Cape district, for change; but the anticipated recovery was not realised, and he died there at an early age. Dr. Cloete was a member of the family of the Cloetes of Constantia and Wynberg, a family who had settled there for many generations and are widely known as wine farmers, while many members have served their country in civil and military offices. Dr. Cloete's name does not appear on the English Register, but is on the roll in the Registrar's office in Edinburgh. He did not register in London, as he did not intend to practise in England.

JOHN BABER, M.D. ST. AND., M.R.C.S., L.S.A.

DR. JOHN BABER, formerly of Thurloe-square, whose death occurred on May 4th at the age of seventy-two years, studied at Lane's School of Medicine and St. George's Hospital. He obtained the qualifications of M.R.C.S. and L.S.A. in 1843, and the degree of M.D. St. Andrews in 1844. From that date till his retirement in 1883 he practised in the western district of London, where he was highly esteemed by a wide circle of patients and friends. After his retirement Dr. Baber devoted considerable time to the relief of the poor, and also gave his personal assistance to the Brighton Medical Mission.

FOREIGN UNIVERSITY INTELLIGENCE.—*Dresden (Polytechnic)*: Dr. Renk, Professor of Hygiene in Halle, has been offered the post of Professor of Bacteriology, Hygiene, and the Chemistry of Alimentary Substances.—*Strasburg:* the medical faculty has received a legacy of a very valuable collection of surgical instruments, together with a sum of £500, by the will of the late Professor Lücke.—*Vienna:* the chair of Surgery vacated by the late Professor Billroth's death has been offered to and accepted by Professor Czerny of Heidelberg.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

THE summer sitting of the General Medical Council, which opened on Tuesday, May 22nd, in very distinctly winter weather, bids fair by the programme, and the progress of business up to the time of our going to press, to be a busy session. The number of members present at the opening meeting formed the nearest approach to a full quota which has occurred for many years. The absence of Sir John Simon, however, excited considerable anxiety among the members of the Council, and on his appearance on the second day he was heartily welcomed.

The only new member at this session is Dr. Charles Moore of Dublin, who was introduced to the Council by Dr. Atthill. The prolonged absence of Dr. Kidd is a matter of much regret, because it not only involves a practical abeyance of the direct representation of Ireland in the Council, but Dr. Kidd's judgment, independence, and large experience are well known to his colleagues. It is to be hoped that he will speedily be able to resume his duties.

The council chamber presented quite a gay appearance, the wall opposite the press gallery being decorated by thirteen large framed diplomas and certificates of various examining bodies. The following bodies were thus represented on the council walls:—The Obstetrical Society of London; the Coombe Lying-in Hospital; the Hospital for the Relief of Poor Lying-in Women in Dublin; the Royal College of Physicians, Edinburgh; the Belfast Lying-in Hospital; the Zenana Medical College; the British Lying-in Hospital; the City of London Lying-in Hospital; the Birmingham Lying-in Charity; An Institution for giving Instruction in the Art of Massage; St. Mary's Hospital and Manchester and Salford Lying-in Hospital; the Manchester Maternity Hospital; and the Missionary Training Home, Glasgow. A closer examination of the documents revealed the fact that they had been collected and forwarded to the Council for their consideration by Dr. Robert R. Rentoul of Liverpool.

The speed with which the disciplinary cases have been got through has astonished and rejoiced even many of the members of the Council. Four important cases were disposed of in a few hours. Two of these were cases of "covering," and the others were cases of advertising which had taken place in one of the Australian colonies. In all cases the names of the practitioners were ordered to be removed from the Register. Mr. Bryant pointed out the importance of aiding colonial medical men in purging their Register from the names of those who indulged in advertising of so glaring a form as that which was notorious in Australia.

At the commencement of the second day's proceedings Dr. Pettigrew called the attention of the Council to the appearance in the chamber of "an apparatus" which might be described as a rostrum, and inquired what was its purpose. Mr. Bryant explained that it was a platform from which anyone desiring to address the Council might speak and be heard by all the members of the Council.

The President's address, of which we print a very full abstract, indicates clearly the wide range of the work which falls within the scope of the General Medical Council. Questions of general education in these days are necessarily large, and questions of medical education in the United Kingdom happen also to be by no means simple of solution. We shall look forward with great interest to the reports of the different visitors to the Examination Committee, for in this direction—that is, in an attempt to level up the tests imposed by the various bodies upon the candidates for their examinations to a fairly uniform as well as a practically high standard—we hold that the General Medical Council is doing its proper and much-needed work. But that this view is not very generally borne out would appear certain by an inspection of table *d* in the general programme of business, which purports to show in tabular form the results of preliminary examinations in 1893. The table has been compiled by the Registrar from such returns as have been supplied by the various examining bodies, pursuant to the Council's request, but a pathetic little foot-note appended by the Registrar to the table explains the gaps in the information given. "The information here inserted," he says, "has for the most part been obtained by searching calendars and reports, the form supplied for answering the Council's prescribed inquiries having been in very few cases filled up by the examining bodies."

The question of the registration of midwives led to an extremely interesting and animated debate.

TUESDAY, MAY 22ND.

Sir RICHARD QUAIN, President, in the chair.

Opening of the Session.

THE usual summer session of the General Medical Council began to-day at the offices of the Council, Oxford-street, London.

THE PRESIDENT'S ADDRESS.

The PRESIDENT, in delivering his address, said: It is a matter for congratulation that, on assembling for this, the fifty-sixth session of the Council, we do so without having to record the loss of any of our colleagues.

Inspection of Examinations for Diplomas in State Medicine.

In accordance with the resolution of the Council passed on Dec. 5th, 1893, arrangements were made with Dr. Duffey by the executive committee for the inspection of the examinations for diplomas in State Medicine. As directed by a resolution passed on Dec. 4th, 1893, I have addressed a communication to the Scottish Universities Commission, requesting them to reconsider their decision in regard to Ordinance X. This they have to some extent done by issuing a Supplementary Ordinance, which has been placed before the Education Committee for report; and this report has been prepared and will be submitted to the Council.

India and the Colonies and the Pharmacopœia.

In reference to the communications which I addressed, through the Privy Council Office, to the Indian and Colonial pharmaceutical authorities (of which copies will be found in Minutes, vol. xxx., pp. 122–4), dealing with Indian and Colonial requirements as regards the Pharmacopœia, no official replies have as yet been received. Dr. Attfield has published a short statement of his own views.

Legal Cases.

The Council, since its last meeting, has been twice involved in legal proceedings. In one case Mr. T. R. Allinson, whose name was erased from the Medical Register on May 27th, 1892, for "infamous conduct in a professional respect," appealed against the decision of the Court of Queen's Bench, which refused to grant a mandamus compelling the Council to restore his name. The appeal was dismissed with costs.

The second case was that of Joseph Steel, against whom proceedings were taken by direction of the Council for using the title M.D. (Bc.), granted by the "General Council of Safe Medicine, Limited." This person was convicted and fined by the Houghton-le-Spring magistrates, and an appeal which he subsequently made has been dismissed with costs.

The Council has also been able to maintain its position in reference to medical practitioners when it has been challenged in the courts of law.

Penal Cases.

Several penal cases, which have been submitted to the committee specially appointed for the purpose of considering such cases, will require the attention of the Council. They embrace charges of unprofessional advertising, false certificate-giving, and covering. Full particulars will be placed in the hands of the members of the Council prior to the hearing of these cases. Mr. E. W. Alabone, whose name was erased from the Medical Register in 1886 (Minutes, vol. xxiii., p. 112), has through his solicitor raised a question as to the power of the Council to erase from the Register the name of a practitioner who has ceased to hold any qualification without hearing him in his own defence. He claims restoration to the Medical Register. The Council will be further advised on this case. A similar point is raised by Dr. Herbert Tibbits.

Practice of Midwifery by Unqualified Persons.

Various documents have been submitted to the Council in regard to the practice of midwifery by unqualified persons; and a committee consisting of the late President (Mr. John Marshall), Sir John Simon, Dr. Glover, Sir Walter Foster, Mr. Carter, Mr. Wheelhouse, and myself, was appointed "to consider the provisions of any Bill for the registration of midwives which may be submitted by the Government to this Council." Viewing the strong opinion expressed by this Council as to the necessity of passing into law some measure for the education and registration of midwives, a like expression of opinion from the Royal College of Physicians of London, the statement as to the feelings of the Privy Council on the subject, and the fact that there exists a Committee of the Council to consider the provisions of any Bill for the registration of midwives, the duty of the Council would seem to be clearly indicated in the matter.

Business of the Session.

I now turn to other important subjects which will constitute the business of the session. In continuation of the scheme for the visitation and inspection of the final examinations of the several licensing authorities, arrangements have been made for the visitation, during 1894, of the English corporations and the Scottish universities. This, as the Council are aware, when accomplished, will complete the cycle of visitations, the Irish Universities and Scottish Corporations having been visited in 1892, and the Irish Corporations and English Universities in 1893. The bodies visited and inspected during the present year are the Society of Apothecaries of London, by Dr. Wilks, and the English Conjoint Board, by Mr. Carter, who also visited the Examination for the Licence of the Royal College of Physicians of London. Mr. Bryant has made a second visitation of the Conjoint Examination in Ireland of the Royal College of Surgeons and the Apothecaries' Hall, Dublin, and has just visited the Clinical Examinations of the University of Edinburgh. Dr. Duffey, acting as inspector, has accompanied the Visitor in each case and has also commenced the duty of inspecting the Examinations for Diplomas in Public Health. The Examination Committee has had under its consideration the reports by the Visitor and Inspector on these examinations and will report to the Council during the present session on the visitation of the Conjoint Board in Ireland of the Royal College of Surgeons and Apothecaries' Hall. On considering the report of this examination the committee recommended that it be again visited and inspected. Subsequently a memorial was presented to the Council by the Royal College of Physicians of Ireland pointing out the deficiences in the requirements of this conjoint board. The examination has accordingly been again visited by Mr. Bryant and Dr. Duffey. The reports of the two visitations, together with the memorial, have been considered by the Examination Committee, who will report to the Council on the subject. The report of the Visitor and Inspector on the examination of the Apothecaries' Society of London, together with the remarks of the Society and a report by the Examination Committee, will be presented. I have read carefully and with very great interest the reports of the Visitors to which reference has been made. The interest consists in observing the various methods for testing the qualifications of candidates adopted by the several licensing authorities, and the comments made upon their proceedings by the Visitors and Inspector. I can well conceive that much information might be gained by those engaged in the education and examination of students from a study of these several documents. Of course differences of opinion will naturally exist as to the methods adopted by the several authorities. The Education Committee will submit reports dealing with the recognition of various Indian, colonial, and foreign preliminary examining bodies and also on deficiencies in preliminary education. The examples of deficiency which come before us in this report on Preliminary Examination are founded not only on the results of the visitation of examinations, but are derived from the communications of the licensing authorities themselves and from the returns of the Directors-General of the Army, Navy, and Indian Medical Departments. It seems to me—and I am sure that the Council will agree with me—that these defects, the serious nature of which is self-evident, demand our careful consideration. There is, I think, some risk that, with the increased attention now given to the extension of scientific and purely professional education and the increasing severity of the examinations in these subjects, the general culture of the student may suffer. The control of the Council over this matter is but slight. We may accept or reject the so-called examinations as sufficient or insufficient; but should we not do more in a different direction? Thus we may, by passing a definite resolution on the subject, cause it to be known that, in our just regard for professional attainments, we do not lose sight of the need for a sufficient standard of general knowledge. The Education Committee will also present a report on the subject of the Scottish Universities Commission's Supplementary Ordinance, on which a lengthy correspondence has recently taken place, as already alluded to at the commencement of my observations. Several questions connected with dental business will require the attention of the Council. Such, then, is a brief *résumé* of the various subjects which must come before us at our present meeting, and which will claim from us much patient consideration.

On the motion of Mr. WHEELHOUSE, seconded by Sir WALTER FOSTER, the President was thanked for his address.

PROCEEDINGS OF THE COUNCIL.

The Business Committee.

The following members were appointed to act as the Business Committee—viz., Mr. Wheelhouse (chairman), Sir William Turner, Mr. Bryant, and Dr. William Moore.

Examination Statistics.

The following tables were received and ordered to be entered in the minutes: (*a*) table showing results of professional examinations held in 1893 for qualifications granted under the Medical Act by the bodies named in Schedule A. of the Act; (*b*) table showing results of professional examinations held in 1893 for qualifications in Sanitary Science, Public Health, or State Medicine; (*c*) table showing results of professional examinations held in 1893 for qualifications granted under the Dentists Act, (*d*) table showing results of preliminary examinations in 1893, compiled by the Registrar from such returns as have been supplied by the examining bodies; and (*e*) table showing the number of exceptional cases that occurred during 1893 in regard to length of course of professional study, together with a statement of the action taken thereon by the several licensing bodies.

The Apothecaries' Society of London.

Mr. MILLER (Registrar of the Council) read a letter which had been received from the Master of the society. In this letter it was submitted to the Council "that one of the assistant examiners in Surgery should retire annually and not be re-eligible for two years. This principle has already been adopted on a large scale by the society in the case of their own examiners. I have further to submit that Mr. Walsham should retire on the present occasion, and the vacancy be filled by the nomination of Mr. Bernard Pitts, F.R.C.S., M.A., M.B., M.C., or Mr. Bilton Pollard, F.R.C.S., M.B., B.S."

Mr. BRUDENELL CARTER, the representative of the society, explained that when assistant examiners in Surgery were first appointed to the society by the Council no period of office was laid down, and the appointments were practically for life. The society felt, and those gentlemen themselves felt, that an examining board was likely to be rendered more efficient by an occasional change in its composition, and they were anxious to carry into effect the same arrangement which the society employed with regard to its own examiners and to allow occasional changes to take place. For this purpose the society was anxious to establish practically a sort of rota under which one examiner should retire annually and should not be eligible for reappointment until after the lapse of two years.

On the motion of Mr. Carter the Council adopted a set of resolutions sanctioning the scheme of the society and the retirement of Mr. Walsham, and appointing Mr. Pitts to the vacancy, his term of office to extend over a period of five years.

Medical Aid Associations.

Mr. BRYANT then addressed himself to the following notice of motion, which stood in his name on the programme of business, viz.:—

"That in view of the rapid increase in number of the Medical Aid Associations conducted by laymen for profit, and the injurious influence such associations have upon public as well as upon professional interests, it is incumbent upon this Council to pronounce a clear and definite opinion on their effects in both their public and professional aspects.

"From the report of this Council issued in May, 1893, it was conclusively demonstrated that in a professional point of view these associations were injurious:

"(*a*) As tending to degrade the professional man to the position of a paid servant of a trade company conducted by laymen, and consequently to lead him to sacrifice his independence and responsibility;

"(*b*) As rendering it obligatory on the medical officers to attend members of the association admitted by the lay authorities—and too often by open canvassing—who from their means and social position have no claim whatever to be medically treated on charitable or inadequate terms; and

"(*c*) By depreciating or degrading the high character of medical science as represented by the officers of these associations working under conditions which are not only humiliating, but which make it most difficult for such officers to do their duty.

"It was likewise shown in our report that these associations, in a public point of view, were injurious (*d*) by depriving the public of what they have a right to expect under all circumstances—that is, the very best that medical science can confer upon them—by reason of the number of patients the medical officers of these associations are required to attend, and the few minutes they can consequently give to the consideration of each case, particularly in periods of epidemic disease, when these professional advantages can generally be obtained from independent and responsible medical men who are fully trusted and adequately remunerated.

"They were (*e*) also lastly, but not leastly, shown to be injurious to the public by not only undermining the healthy independence of character, which it is so essential to encourage, and helping to pauperise a large section of our people, but they at the same time lead the public to believe—what is so far from the truth—that efficient medical skill and the application of high science are to be purchased for a few shillings a year.

"With these facts before us which the report of our committee has demonstrated, I would ask the Council to pronounce the conduct of men who accept the appointments of medical officers to these associations as infamous in a professional respect, and at the same time to refer the matter to our legal advisers, to consider whether these Medical Aid Associations are rightly registered under the Friendly Societies Act of 1875, for as I read this Act, it is to provide by voluntary subscription or donations for the relief or maintenance of the members and their families during sickness or other infirmity, whether bodily or mental, in old age, or for the relief or maintenance of the orphan children of members during minority, and certainly not for the purpose of helping trading companies of any kind to make profits for their own benefit."

Mr. Bryant said that he introduced this subject under a strong sense of the harm these Medical Aid Associations did both to the public and the medical profession. He had reason to believe that these associations had not been rightly registered under the Friendly Societies Act. Anyone who cared to look at the Act would see that it was never intended for such institutions. He would not ask the Council to pronounce that the conduct of men who accepted appointments was infamous in a professional respect, but he would move that the opinion of their legal advisers be obtained on the point whether or not these associations were rightly registered under the Friendly Societies Act. Even if it were the case that they were rightly so registered, then it might be for the Council to point out to the Government the harm the associations did, and ask the Government to withdraw them from the scope of the Act.

Sir DYCE DUCKWORTH formally seconded the motion.

Dr. MCVAIL said he did not think that this legal point entered into the question with which the Council had to deal. The only question for the Council was whether the medical officers of these associations, in acting for them, were guilty of infamous conduct in a professional respect, and that question was not affected by the point whether or not the associations were rightly registered under the Friendly Societies Act. The matter could not be dealt with in this general fashion. They must take up cases individually and treat them on their merits.

Sir WALTER FOSTER agreed that the legality of the registration was not a matter for this Council, and said that if the question was to be reopened the proper plan would be to reappoint Dr. Glover's committee and ask them to bring up some resolution which would meet the general opinion of the Council. He was very anxious that the men who had engaged in this form of practice should be extricated from what was a false position.

Dr. GLOVER said that Mr. Bryant's action certainly put the Council in a difficult position. In the history of the Council he did not think there had been an instance of such a long resolution supported by so short a speech. Furthermore, Mr. Bryant had abandoned, at any rate for the moment, the principal part of his resolution, that asking the Council to express the opinion that anyone taking these appointments was guilty of infamous conduct in a professional respect. He certainly thought the Council was to be congratulated on the opinions now expressed on this subject by Mr. Bryant and Si Dyce Duckworth. Last year the committee proposed, after very serious and careful investigation, a series of very moderate resolutions, and he found from the division list that both these gentlemen voted against them. That was the opportunity for the Council to express its opinion upon this most important subject. At the same time he had no objection to the matter being reopened, and he would suggest that Mr. Bryant, Sir Dyce Duckworth, and Dr. McVail might be added to the committee.

Dr. MACALISTER intimated that he did not wish to serve again upon the committee. He did not think that any new facts were to be ascertained, and nothing did more harm than turning round upon their decisions.

Dr. LEECH said he did not wish to serve again on this committee.

Sir W. TURNER said it was very difficult at that moment to know what they were to speak about. He thought Mr. Bryant should let the Council know what he wished them to consider, and until they knew that he did not think Sir Walter Foster could move any amendment.

Mr. BRYANT said his object in bringing this motion before the Council was to raise the subject again, because he felt that at the last meeting of the Council many of them were a great deal too weak-kneed, and did not express a sufficiently clear opinion on the point. He was disappointed with the very watery resolutions they passed at that time, and during the time that had passed surely much more evidence had been forthcoming as to the injurious influence of these Medical Aid Associations. His object as a climax was to ask the Council to do two things, but he gathered since he put the motion on the programme that it would be a mistake to ask the Council now to pronounce that the conduct of the men taking employment under these associations was infamous in a professional respect, and therefore he had not moved to that effect, though he himself regarded it as such. As Sir W. Turner had asked him to formulate the resolution he desired to place before the Council, he would do so in the following shape:—"That in view of the rapid increase in number of the Medical Aid Associations conducted by laymen for profit, and the injurious influence such associations have upon public as well as upon professional interests, the Council should ask its legal advisers to consider whether these Medical Aid Associations are rightly registered under the Friendly Societies Act of 1875, for as I read this Act, it is to provide by voluntary subscription or donations for the relief or maintenance of the members and their families during sickness or other infirmity, whether bodily or mental, in old age, or for the relief or maintenance of the orphan children of members during minority, and certainly not for the purpose of helping trading companies of any kind to make profits for their own benefit." At the same time, if Sir Walter Foster thought that the matter would be best considered by Dr. Glover's committee, he should be glad to join the committee.

Dr. WILKS said he should have no difficulty about this matter, because whenever it came before the Council he should vote against it. In his opinion it was *ultra vires* as regarded the Council's functions. He deemed that the Council were there in the interest of the profession. This was a Government institution, and they were there simply to place proper men on the Medical Register and to take off improper men. He contended that this question came before them simply through medical men in the provincial towns, owing to rivalry; and in order to get out of a difficulty the Council passed those weak resolutions.

Mr. Bryant's resolution having been read by the REGISTRAR,

Mr. WHEELHOUSE said they had an opinion from Mr. Muir Mackenzie that these associations were rightly registered.

Dr. BRUCE said there was nothing to prevent any person from getting up associations for the purpose of medical aid, and he agreed with Dr. McVail's contention that they could only deal with the case of medical officers of these associations individually.

Sir W. FOSTER suggested to Mr. Bryant that, as this

debate was sure to do some good, he might be content at present with having called attention to the matter again and withdraw his resolution, and possibly before next meeting he might be able to devise some other method of proceeding in this matter.

Mr. BRYANT said he was quite willing to fall in with that suggestion. His object was to call attention to the matter.

The resolution was then withdrawn.

Re Joseph Steel and the General Council of Safe Medicine, Limited.

The next business was to receive the following report by the solicitor in regard to the case of Joseph Steel :—

"On Nov. 30th, 1893, it was resolved by the General Council, 'That the President, in conjunction with the legal advisers of the General Medical Council, take such steps as may be necessary to test the validity of the titles purporting to be granted by the said General Council of Safe Medicine, and assumed by the holders of degrees or diplomas of that Council.' In pursuance of such resolution, I, by the instructions of the President, caused proceedings to be taken, under the 40th Section of the Act of 1858, against Joseph Steel, at the Houghton-le-Spring Petty Sessions, for using the title M.D. (Bc.). conferred on him by the General Council of Safe Medicine, and he was, on Feb. 1st last, convicted by the Justices to pay a penalty of £10, and £4 1s. 6d. costs. Steel appealed from this conviction, and the appeal was argued on May 9th and 10th inst. in the Court of Queen's Bench, before Justices Wright and Henn Collins, when the conviction was upheld, and the appeal dismissed with costs. It will be for the Council to consider whether any further steps should be taken either to prosecute the manager of the association which grants these sham degrees, or to bring an action in the name of the Attorney-General on the relation of the General Medical Council, as advised by Mr. M. Mackenzie. "FREDK. WILLIS FARRER.

"May 17th, 1894."

Mr. WHEELHOUSE moved :—"That the President take such steps, in conjunction with the legal advisers of the Council, as may be thought advisable to put an end to the granting of so-called degrees by the General Council of Safe Medicine."

He said this matter was before the Executive Committee on the previous day. Mr. Farrer, in explaining the steps that had been taken went very fully into the question and into the course which it would be wise for the Council to adopt. He thought the Council should assume a firm aspect, with the view of seeing whether the whole thing could not be put down at once. The resolution he now proposed was based on the advice which the solicitor had given.

Dr. GLOVER, who seconded the resolution, said he could not but congratulate the Council on its action in this matter and also upon the result. But he must say that their success upon this occasion raised the question whether they should not have taken similar action on many other similar questions before. He hoped, however, the admirable way in which the Council had been justified by the decision of the Court of Appeal for its vindication of the sacredness of titles would induce the Council on future occasions to do its duty in bringing such matters to an issue. He could not but feel that the Council had been backward in this matter.

In the course of a brief conversation,

The PRESIDENT said it was pointed out to them that there were two courses to pursue—either to prosecute individuals or go to the fountain head of the mischief. It was left open to determine which course should be pursued, and he thought they might have confidence that such steps as were necessary would be taken. Something must be done.

Sir W. FOSTER added his congratulations upon the successful issue of this prosecution, and said that he looked upon this matter as a great public scandal.

Certification of Midwives.

A number of communications in regard to midwives were received and entered on the minutes. The first was from the Home Office forwarding the copy of a rider adopted by the Bridgwater coroner's jury censuring a midwife for not calling in medical assistance upon difficulties arising on the deceased giving birth to a child, and expressing the opinion "that the Legislature should interfere to prevent women acting as midwives unless trained and certificated for such purpose." There was also sent from the Home Office the following anonymous letter :—

"SIR,—I take the liberty of wrighting to you on the duty of Midwifves as there is so many put them selves up as such and dont know no more about such work then a child they run the risk there have been so many instances of it recently. I my self had to pay 16 guinies to be instructed in the art of Midwifery had to pass the drs and gave three month before I could with a Certificate, and its not a right thing for these sort of women to be allowed to go on. there have been several cases in the paper that women have lost there lives through haveing them handy women, and another thing there would not be so many infants left about in different places. this woman which attended on this case she call her self a midwife but she is not a midwife Sir we shall be very thankful to you as soon as the Midwifes Bill Pass to stop those women from goin to do such duty unless they have got a Certificate for such work hopeing Sir you excuse the liberty Ive taken your Obediant Servant. E. H. Certified Midwife."

The other communications were from the Lancashire and Cheshire Branch of the British Medical Association, against such legislation as is proposed by the Midwives' Registration Association ; from Dr. R. R. Rentoul, forwarding a petition "against the proposed formation of an inferior order of midwifery practitioners, or the so-called 'registration of midwives'"; from the Preston Medico-Ethical Society, forwarding an identical petition ; and from the Incorporated Medical Practitioners' Association.

Dr. Rentoul had sent to the Council twelve specimens of these diplomas from various bodies. The one from the Coombe Lying-in Hospital certified that A. B—— "had duly attended the practice of this hospital for six months," after which she had received the "certificate testifying to her competence to act as a midwife and ladies' nurse-tender." The master and assistants of the Hospital for the Relief of Poor Lying-in Women in Dublin state "her proficiency by an examination." The diploma issued by the College of Physicians, Edinburgh, state that A.B. was duly examined in midwifery and found competent to practise it. The Belfast Lying-in Hospital had its document emblazoned with a large red seal and began, "Know all men by these presents" that the candidate after examination had been found qualified to practise midwifery. The diploma granted by the Zenana Medical College indicated that the holder had received instruction in "medicine, disorders of tropical climates, minor and practical surgery, including diseases of the eye, midwifery, and diseases of women, and we find that she possesses a knowledge of them that will qualify her to render professional aid in ordinary cases of disease." Other diplomas on similar patterns were present from the British Lying-in Hospital ; the City of London Lying-in Hospital, the Birmingham Lying-in Hospital, the Obstetrical Society of London, an Institution for Instruction in Massage, the Manchester and Salford Lying-in Hospital, the Manchester Maternity Hospital, and the Missionary Nurses Training Home, Glasgow.

Mr. WHEELHOUSE moved :—(*a*) "That after Jan. 1st, 1895, the Council will consider any registered medical practitioner who shall sanction the issue to any midwife or other person who has not passed a qualifying examination in medicine, surgery, and midwifery, as provided by the Medical Act (1886), of a certificate or diploma which shall imply a qualification to practise midwifery as 'guilty of infamous conduct in a professional respect.' (*b*) That a copy of this motion be sent to such institutions or persons as have been in the habit of issuing the aforesaid certificates or diplomas so far as these institutions or persons are known to the Council."

Sir DYCE DUCKWORTH seconded the motion.

Sir WILLIAM TURNER moved as an amendment : "That, in the opinion of the Council, the issue to women of any certificate of competency, or other document, so framed as to bear a colourable resemblance, either in appearance or phraseology, to a diploma conveying a right to be registered as a medical practitioner, is a proceeding in direct contravention of the spirit of the Medical Act of 1886, and one which will be liable to be visited with the condemnation of the Council. The President is therefore requested to repeat a warning, already given, to certain institutions, and to urge on the registered practitioners connected with the institutions granting these certificates to nurse midwives to reconsider the terms in which they are framed, and to bring them into harmony with this resolution."

Mr. BRUDENELL CARTER said that to pass this resolution in its entirety would be trades unionism run mad. The President had well said that there were ten or fifteen thousand midwives practising in the United Kingdom, and to pass a resolution of this kind would be to strike a blow at the whole of them. He would suggest that as the Council had already sent one notice to those medical practitioners who granted these diplomas, that the Council should now issue a second note of warning.

Dr. WILKS would have nothing to do with a resolution of this kind, and proposed to leave matters as they at present stood.

Dr. MACALISTER said he was certainly in favour of the education of midwives, and that these certificates should not be granted except to those who had a certain amount of practical training, but, referring to the diplomas before them, he could not help admitting that such certificates as these were

calculated to mislead the ignorant. One bearing a large red seal upon it was specially objectionable.

Dr. ATTHILL could not vote for the original motion. He was strongly in favour of the education of midwives, and objected strongly that any such certificates or documents should carry with them the right of the holder to practise midwifery or diseases of women. Generally in a course of two or three months' training it was quite impossible that anybody could obtain a competent knowledge of that science, and such certificates were a gross deception and calculated to do injury to the public.

The Penal Clauses of the Medical Act.

A communication was received and entered on the minutes from the Parliamentary Bills Committee of the British Medical Association, enclosing a report presented by the chairman of the committee on the amendment of the penal clauses of the Medical Act, 1858, for the comment and approval of the Council. The draft amending clauses submitted were as follow:—

"Whereas in order that persons requiring medical or surgical aid should be better enabled to distinguish between qualified and unqualified practitioners, it is expedient to extend and amend the Medical Act, 1858. Be it therefore enacted, &c., &c.

"1. This Act may for all purposes be cited as the Medical Act Amendment Act, 189 .

"2. If after the passing of this Act any person other than a person whose name is for the time being on, or entitled to be on, the Medical Register, or who, prior to the passing of the Medical Act, 1886, would have been entitled to be registered, shall take or use the name or title Physician, Doctor of Medicine, Licentiye in Medicine or Surgery, Bachelor of Medicine, Surgeon, General Practitioner, Medical Practitioner, Apothecary, Aurist, Oculist, Accoucheur, or any title, style, addition, or description directly or indirectly implying that he is registered under this Act, or that he is specially qualified to practise medicine or surgery or any branch thereof, he shall, upon a summary conviction for any and every such offence, pay a sum not exceeding £ . It is hereby declared that the words 'title, style, addition, or description,' where used in this Act, include any style, title, addition to a name, designation, or description, whether expressed in words or by letters, or partly in one way and partly in the other.

"3. With respect to the offence of a person not registered or entitled to be registered under the Medical Acts for the time being taking or using any name, title, addition, or description as above in this Act mentioned the following provision shall take effect: (1) He shall not be guilty of an offence under this Act: (a) If he shows that he is not ordinarily resident in the United Kingdom, and that he holds a qualification which entitles him to practise medicine or surgery in a British possession or foreign country, and that he did not represent himself to be registered under the Medical Acts. (b) If he shows that he has been registered, and continues to be entitled to be registered, under the Medical Acts; but that his name has been erased on the ground only that he has ceased to practise.

"4. Any penalty to which under this Act any person is liable on summary conviction may be recovered by the General Medical Council or any person with their consent in the manner provided by section 41 of the Medical Act, 1858, and any sum or sums of money arising from recovery of penalties as aforesaid shall be paid to the treasurer of the General Medical Council, or person suing with their consent; anything contained to the contrary in the Metropolitan Police Acts or any Act passed before the passing of this Act notwithstanding."

The case of Mr. E. B. de B. Robertson.

The Council then considered the application of Mr. E. B. de B. Robertson for the restoration of his name to the Medical Register, from which it was erased on May 26th, 1892. The Executive Committee reported in favour of the application, to which the Council after deliberation acceded.

The Council then adjourned.

The Registration of Midwives.

After pointing out to the Council the very strong feeling that was growing up in the profession on the subject of the creation of a new and inferior order of practitioners, Mr. WHEELHOUSE drew attention to the diplomas conspicuously displayed in the room and reminded the Council that they were issued by various bodies some of whom had, perhaps, a chartered right to undertake the duty of examining candidates, but many of whom had no such right. The Medical Act of 1886 declared that no one should be admitted to the Medical Register who had not passed a qualifying examination in Medicine, Surgery, and Midwifery, and the regulations of the Council and of the constituted authorities were such that no one could do this without having spent five years in acquiring the necessary knowledge, and yet, in direct contravention of this Act, and of all such regulations—here—if the issue of these diplomas was to be permitted—a door was opened by which women were to be permitted to practice midwifery only, without any knowledge of either medicine or surgery; and this, he argued, was in effect either a direct repeal of the Act or a means, at any rate, by which its provisions might be evaded. The documents, which to the public were calculated to give rise to the impression that they were really "diplomas," gave the same impression to those who held them, and who had paid for them. Are the public sufficiently educated to draw a distinction between such documents and real "diplomas"? It would be in the memory of the Council that two years ago the President was requested to point out to such bodies as were known to issue these documents that they were calculated to deceive the public and to mislead their holders as to the powers thus conferred, and to point out that they needed very serious modification. This had been done, but the bulk remained unaltered, and some further step had become imperatively necessary. He desired emphatically to assure the Council that he would use every effort in his power to further any steps that might be taken to advance the education of those women who followed the calling of midwifery nurses, for he was fully alive to the necessity of doing this and of giving the educated any and every possible advantage over the uneducated nurse, but he could never consent to the institution of an inferior order of practitioners authorised to act on their own responsibility, even in so-called natural labours.

Sir JOHN BANKS said that as consulting physician to a lying-in hospital he certainly could not agree to the resolution as it then stood.

Dr. TUKE wished to know whether it was seriously contended that every midwife should have a knowledge of surgery and medicine.

Sir W. FOSTER said the Council could not possibly pass a resolution that every midwife must have a knowledge of midwifery, surgery, and medicine. If they passed the resolution they would create a class who would be to all intents and purposes regular medical practitioners.

The PRESIDENT thought there were two questions in reference to this matter—one the education of women, which the Council had advocated, and had passed a resolution to that effect and appointed a committee to consider the question; the other question was, What shall be done with these documents? Perhaps the best thing to do would be to summon the authors of one or two of the worst and tell them that they were guilty of infamous conduct in using such documents.

Sir WM. TURNER read an alternative resolution (which was carried) and suggested that notice should be sent to medical practitioners and institutions that the form of the certificates should be altered so as to remove the objections.

Dr. MCVAIL agreed with the President that the better plan would be to bring some offenders before the Council and caution them.

Dr. MACALISTER said that a fallacy underlay not only Mr. Wheelhouse's speech, but also some of the other arguments that had been laid before the Council in the form of memorials. The medical Acts to which reference had been made did not purport to prevent the *practice* of medicine, surgery, or midwifery by unregistered persons. Any man or woman was in this country free to practise any one of these arts so long as no pretence was made of being *registered*.

WEDNESDAY, MAY 23RD.

The session was resumed to-day, Sir RICHARD QUAIN in the chair.

The Golden Wedding of Sir James and Lady Paget.

The PRESIDENT said he had pleasure in informing the Council that this was the golden wedding day of Sir James and Lady Paget. Sir James was long with them, and they had for him that affection and esteem which was shared by the whole medical profession, and it had been proposed that a resolution of the Council of a congratulatory character should be sent to Sir James and Lady Paget. The resolution would be to the effect "That the General Medical Council desires to express to Sir James and Lady Paget most hearty congratulations on the auspicious occasion of their golden wedding day."

The proposal was received with the utmost cordiality by the Council, and at once adopted.

The case of Dr. George Davidson.

The Council then proceeded to consider the case of Dr. George Davidson (registered as M.B. Mast, Surg., 1866, Univ., Glasgow), against whom the following charge had been formulated by the Council's solicitor:—

"That, being a registered medical practitioner, he lent or afforded his presence, advice, and assistance, and the aid of his professional qualifications to an unqualified person named Mylan residing and carrying on a medical practice at 129, Carlisle-road, Sheffield, and thereby

enabled the said unqualified person to attend and administer medical aid and medicines to patients, and to recover charges therefor, and to carry on a medical practice as if he were duly qualified, thus acting as cover to Mylan."

Dr. BATEMAN, of the Medical Defence Union, read a number of affidavits in support of the charge.

Mr. DAVIDSON submitted that Mylan was nothing more than his unqualified assistant, that with very few exceptions he (Mr. Davidson) visited all the patients, that he was not absent from the practice for a single day prior to the receipt of the summons to appear before this Council, and that there had been no irregularity whatsoever in the issue of certificates.

After deliberation in private, the Council came to the conclusion that Mr. Davidson had committed the offence of covering charged, which, in their opinion, was infamous conduct in a professional respect, and directed the Registrar to erase his name from the Medical Register.

The case of Mr. John Melvin Campbell.

The Council next considered the case of John Melvin Campbell (registered as Licentiate of the Society of Apothecaries, London, 1878), who was complained of by the Queensland Medical Board, and against whom the following charge had been formulated by the Council's solicitor:—

"That, being a registered medical practitioner, he is, or was at the time the complaint was made, associated with or one of a body of persons carrying on business at Queensland under the name of 'The Progressive Remedy Institute,' and that he lends his professional qualifications and name to further and aid the sale to the public of the quack remedies and cures publicly advertised by the said body of persons, and to enable them to carry on in the said colony a medical practice which is objectionable and dangerous to the public."

Mr. Campbell did not appear.

Mr. MUIR MACKENZIE, Q.C., the legal adviser of the Council, having submitted the documents and evidence in the case, which he said included advertisements and announcements of the familiar quack type, and announcing that their medical expert had been registered by the Queensland Medical Board, and was legally qualified, read the defence put in by Mr. Campbell. That embodied a certificate from Mr. Howard Freeman to the effect that he ceased to practise on a medical certificate of this Institute on Feb. 28th, 1893, and had not been since connected with it professionally or otherwise. The Institute, it further appeared, did not consist of a number of qualified persons who carried on medical practice, but it was solely owned and managed by Mr. Howard Freeman on strictly legal and legitimate principles.

Mr. BRYANT said he was glad the Queensland Medical Board had taken this action, and thought they were entitled to the assistance of the Council in the matter.

After the Council had deliberated in private,

The PRESIDENT announced that they were of opinion that the offence charged had been committed, and the Registrar was instructed to erase Mr. Campbell's name from the Register.

The case of Dr. Eliza Foster MacDonogh Frickhart.

The Council considered the case of Dr. E. F. M. Frickhart (registered as M.D. Univ. Zurich, 1877), who was complained of by the Royal College of Physicians of Ireland, and against whom the following charge was formulated by the Council's solicitor:—

"(*a*) That she had violated the undertaking subscribed by her before being admitted as a Licentiate of the King and Queen's College of Physicians of Ireland (now the Royal College of Physicians of Ireland), by which she engaged not to endeavour to obtain practice, or to attract public notice, by any unworthy means, and not to permit or sanction the use of her name for such purposes or in connexion with any secret remedy; (*b*) that she systematically seeks to attract practice by a system of public advertisements, such advertisements being of a character discreditable to a registered medical practitioner."

Dr. Frickhart did not appear.

Mr. MUIR MACKENZIE read the documents in the case, from which it appeared that advertisements of the usual kind had appeared in all the papers of the Colony of Victoria.

Having deliberated on the case,

The Council decided to remove Dr. Frickhart's name from the Medical Register.

The case of Mr. Denis Collins.

In this case the person summoned, who did not appear, was registered as Member, Royal College of Surgeons, England, 1863, and the charge was as follows:—

"(*a*) That he, being a registered medical practitioner, did cover and assist an unqualified person named Francis McConville, in whose employment he was, in carrying on at 14, Brunswick-road, and 9, Erskine-street, Liverpool, and elsewhere in Liverpool, a system of advertising, selling, and administering quack remedies and cures and medicines to the detriment of credulous and ignorant persons; (*b*) that he, being a registered medical practitioner, had himself and in his own name, been carrying on a system of advertising so-called remedies and cures, and seeking to attract medical practice and induce foolish and credulous persons to consult him by circulating improper and discreditable advertisements and pamphlets."

Mr. MUIR MACKENZIE described the case as most wicked and abominable. The man McConville was now suffering penal servitude for frauds, and his conduct was severely commented upon by Mr. Justice Day in passing sentence upon him at the Liverpool Assizes, the learned judge describing his business as most cruel, and of a kind which ought to be exterminated. Mr. Collins had admitted at this trial and at another trial, as well as to Detective-Inspector Robertson of Liverpool, that he was in the pay of this man.

The Council erased Mr. Collins's name from the Register.

The case of Mr. Neville Holland.

The practitioner in this case, who appeared, was registered as Lic. Soc. Apoth. Lond., 1869, M.R.C.S. Eng., 1870, and the charge he was summoned to answer was:—

"(*a*) That he, on the 9th October, 1893, at Bethnal Green, in the County of London, and in the Metropolitan Police District, did unlawfully and wilfully make and issue a false certificate concerning the death of one Emily Hewitt for the purposes of the Births and Deaths Registration Act; and (*b*) that he is charged with infamous conduct in a professional respect, in that he had acted as cover to an unqualified practitioner named Davies, permitting and enabling him to practise as if he were duly qualified, and in the course of acting as such cover had signed and given medical certificates in cases attended by the said Davies and not by him."

Dr. HUGH WOODS, who represented the London and Counties Medical Protection Society, by whom the complaint was made, said he was informed that the house where Mr. Holland resided was not rented by him, but that in the rate-book the name of the unqualified person was the one entered. He was really assistant to the unqualified person.

Mr. HOLLAND said he had nothing to say in self-defence except in regard to the certificate he signed. He did it through inadvertence. He believed it to be perfectly correct, not as a matter of protection, but as being absolutely true, and knowing also that if there was anything which was false about the case a coroner's inquiry would be called for. With regard to his covering, the matter resolved itself into this, that he was solely responsible for the charge of the practice. He saw all the patients who were in any sense in a dangerous condition, or who required more aid than his unqualified assistant could give, and he felt perfectly satisfied that he had discharged his medical duty in a strictly professional sense with the exception of having signed those certificates.

Dr. GLOVER said he read in the statement put in by Mr. Holland that Mr. Davies, the assistant, though not legally qualified, had great experience, and often used the instruments successfully. He asked Mr. Holland if it was a common thing for him to leave his unqualified assistant to put on forceps.

Mr. HOLLAND said Mr. Davies had passed all but his final examination of the Royal College of Surgeons, and had had large experience in the use of the forceps. He told Mr. Davies to please himself as to putting on the forceps in this case, thinking he was as competent to do it as himself. Mr. Davies did not send for him as the patient was dying. He had been in attendance on the case for an hour or an hour and a half. He was not aware that the Council disapproved of such conduct on the part of a practitioner as to putting on forceps.

Replying to Sir W. Turner, Mr. HOLLAND said the house was in Mr. Davies's name, but he paid rent for the surgical portion of the rooms.

Replying to Mr. Attbill, Mr. HOLLAND said Mr. Davies had been his assistant just under five years; he was there when he (Mr. Holland) succeeded to Mr. Thomas, in whose employ he supposed Mr. Davies was for three or four years.

Dr. BRUCE called Mr. Holland's attention to the fact that in the Register he appeared as residing at 13, Sewardson-road, Bethnal-green.

Mr. HOLLAND: That is a mistake of the Registrar.

Dr. BRUCE: How far is this place distant from 134, Green-street, where you reside?

Mr. HOLLAND: A stone's-throw.

Dr. BRUCE: How long have you resided at 134, Green-street?

Mr. HOLLAND: For four years.

In reply to Mr. Carter, Mr. HOLLAND said there was a post-mortem examination in this case, and it was done by order of the coroner by two independent medical men.

Sir JOHN SIMON: Did you send your assistant as a matter of course to midwifery cases?

Mr. HOLLAND: Not as a matter of course, but in the ordinary way that medical men would.

Replying to Dr. Hector Cameron, Mr. Holland said he lived seven years at 13, Sewardson-road, having a postal address there. Mr. Davies was living at Green-street when he went there four years ago.

Dr. PETTIGREW: What salary did you give Mr. Davies as assistant?

Mr. HOLLAND: Well, if it is a fair question, Mr. Davies had £100 a year.

Dr. GLOVER: Did your assistant get any part of the fees of the cases he attended?

Mr. HOLLAND: Three shillings and sixpence for each case. The midwife in this case left before his assistant arrived.

Dr. MCVAIL: Did you buy this practice?—It was not a purchase of the practice, but an understanding.

With whom?—Between ourselves, so to speak.

But who were ourselves?—The practice belonged to Dr. Thomas's father, who had a place in Wales. The arrangement was with the old gentleman. He wanted a sum of money for the practice and I arranged to make up the payments to him.

Could you prove that you entered into an arrangement with Dr. Thomas's father to take over the practice for a pecuniary consideration?—Certainly.

Dr. MCVAIL: I think it will be of great consequence if this gentleman could prove that; that he should have an opportunity of doing so, as to some extent that would show that the relationship was not quite what one might expect in the circumstances.

The Council then considered the case in private, and on the readmission of the public,

The PRESIDENT said it was the opinion of the Council that Mr. Holland had committed the offence of covering charged against him, that that offence, in the opinion of the Council, was infamous conduct in a professional respect, and that the Registrar had been directed to erase his name from the Register.

The Council then adjourned.

THURSDAY, MAY 24TH.

The Council resumed its session to-day under the presidency of Sir RICHARD QUAIN.

The case of Mr. Stephen Berry Niblett.

The first case considered was that of Mr. Stephen Berry Niblett, residing in London (registered as Lic. Soc. Apoth. London, 1858; Lic. R. Coll. Phys. Edin., 1860; Lic. Fac. Phys. Surg. Glasgow, 1861), who, on the complaint of Mr. W. H. Murray of Adlington, Lancashire, was charged—

"That, being a registered medical practitioner, he seeks to attract practice by a method of publicly advertising his name, address, and qualifications, thereby inviting and suggesting to persons to consult him and to purchase from him cures, remedies, and medicines, which he publicly advertises; and, further, that the forms and methods by which he so advertises himself and his cures, remedies, and medicines to the public are in themselves professionally discreditable."

Mr. FARRER, solicitor to the Council, explained the facts of the case. He read a number of extracts from a pamphlet published by Mr. Niblett entitled "A Practical Treatise upon Epilepsy, its successful Treatment and Cure, with Essays on Giddiness, Sensations, and Faints." The pamphlet, he said, had a picture of Mr. Niblett's consulting-rooms and laboratory. Mr. Farrer also read several advertisements inserted in daily newspapers. The questions for the Council to decide were whether these advertisements were unprofessional and improper, and whether the secret cure, if one might so call it, for epilepsy was in accordance with their views of proper professional conduct.

Mr. NIBLETT said he was charged with advertising his name, address, and qualifications, but the advertisements Mr. Farrer had read bore no reference whatever to his qualifications. He admitted that they bore his name and address. His contention was that he stood in exactly the same position as the members of the staff of a large hospital which advertised for patients. He could mention a dozen hospitals which advertised, and if his action was discreditable so also was that of the medical men associated with these institutions.

The Council, having considered the case in private, found the charge proved and ordered the Registrar to remove Mr. Niblett's name from the Medical Register.

The case of another practitioner summoned on the charge of having associated himself in a business capacity with an unregistered person was also under consideration. The President intimated to him that the Council, though of opinion that indiscretion had been committed, would not order his name to be removed from the Register. We must postpone publication of further details of the business transacted on Thursday until next week.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—The following candidates have passed in the subjects indicated:

Surgery.—D. R. Bernhardt, St. George's Hospital; J. J. Edwards, St. Mary's Hospital; F. S. Flint, King's College; A. W. Haines, Birmingham; S. H. Long, University College; W. MacLellan, St. Mary's Hospital; R. Marshall, Manchester; G. P. U. Prior, King's College; E. Ransome, Guy's Hospital; F. W. Rock, St. Bartholomew's Hospital; D. M. Ross, St. George's Hospital; A. L. Saunders, St. Bartholomew's Hospital; and A. P. Woolfright, St. Bartholomew's Hospital.

Medicine, Forensic Medicine, and Midwifery.—W. Allingham, St. George's Hospital; D. R. Bernhardt, St. George's Hospital; G. S. J. Boyd, London Hospital; G. J. Branson, Birmingham; J. S. Challice, London Hospital; J. E. H. Davies, London Hospital; F. E. Dufty, Sheffield; C. F. Le Sage, London Hospital; A. R. M'Cullagh, Charing-cross Hospital; D. M'C. Ross, St. George's Hospital; and F. A. Storr, Leeds.

Medicine and Forensic Medicine.—F. C. Sutherland, St. Bartholomew's Hospital.

Medicine.—J. B. D. St. Cyr, St. Bartholomew's Hospital; W. Sutcliffe, Birmingham.

Forensic Medicine.—L. J. K. Lake, King's College.

Midwifery.—D. W. Jones, Charing-cross Hospital.

To Messrs. Bernhardt, Boyd, Branson, Davies, Rock, and Ross was granted the Diploma of the Society entitling them to practise Medicine, Surgery, and Midwifery, enabling the holder to compete for medical appointments in the army, navy, and India service; also for civil, colonial, and Poor-law appointments.

ROYAL UNIVERSITY OF IRELAND.—The following have passed the examination for the M.B., B.Ch., and B.A.O. degrees:—

Upper Pass Division.—Francis Gallagher, *William J. Maguire, John Reed, John D. Rice, and *William D. J. Thompson. Candidates marked with an asterisk may present themselves for the further examination for honours.

Pass Division.—James C. Adams, Wilberforce J. Arnold, James N. Browne, Walter Farrington, Patrick Gerety, Thomas T. McKendry, Samuel M. Magowan, John Morrow, Harriette R. Neill, Alexander Park, John Rusk, and John J. Wallace.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS IN IRELAND: CONJOINT SCHEME.—The following have passed the Final Examination:—

J. G. Berne, M. Betty, J. Campbell, C. J. Fallon, W. B. Felton, Misseli Goodwin, T. C. Harte, C. Kapp, P. F. Lyons, S. P. Martin, F. J. Mathews, H. McAvoy, E. Smith, W. A. Twigg.

Medicine.—D. J. Carroll, T. J. Considine, W. A. Goodson, R. F. Harding, A. J. Kearney, W. F. Pigott, C. Skelly, P. Van Homrigh.

Surgery.—C. A. Black, A. W. N. Bowen, J. F. A. Bulfin, D. J. Carroll, T. J. Considine, R. F. Harding, T. Fagan, R. D. Jephson, H. S. Laird, R. E. Smith.

Ophthalmic and Aural Surgery.—A. W. N. Bowen, C. J. S. Cahill, T. Fagan, W. A. Gordon, R. D. Jephson, H. S. Laird, R. E. Smith, W. A. Woodside, P. Van Homrigh.

Midwifery.—A. W. N. Bowen, C. J. S. Cahill, D. J. Carroll, T. J. Considine, J. G. Crozier, M. A. Corcoran, A. T. Kearney, R. J. Maguire, E. A. Malcomson, W. F. A. McCann, A. E. Seale, R. E. Smith, P. Van Homrigh.

Forensic Medicine and Hygiene.—A. St. L. Burke, D. J. Carroll, T. J. Considine, W. A. Gordon, A. T. Kearney, R. G. Maguire, W. F. Pigott, and P. Van Homrigh.

THE annual dinner of the London and Counties Medical Protection Society will be held at Frascati's Restaurant on Tuesday, June 19th, at 7 P.M. Prior to the dinner the statutory annual meeting will be held. We are desired to say that it is hoped that early application will be made for dinner tickets, as ladies will be admitted, and the space at the disposal of the dinner committee is limited. It is also hoped that there will be a full attendance of members at the meeting, as matters of great importance to the profession will be discussed.

MR. W. M. CONWAY'S spirited lecture on his recent adventurous exploits in the Himalayas attracted a large and appreciative audience on Saturday night last to Clifford's-inn Hall. The drawings which were made during their eighteen months' sojourn in Cashmere by Mr. A. D. M'Cormick were displayed on the walls of the room and afforded proof that if the memorable climb made by Mr. Conway and his party to the highest altitude ever reached by man was attended with great danger it also had some compensating advantages in unrivalled opportunities for viewing nature at her grandest.

THE Medical Faculty of the Catholic University, Dublin, have nominated Professors Roche and M'Weeney as their delegates to the International Sanitary Congress at Budapest.

COTTAGE HOSPITAL FOR SAWBRIDGEWORTH.—Towards the erection of the proposed cottage hospital for Sawbridgeworth and district contributions amounting to between £200 and £300 have been received. A site has been given for the purpose by Mr. Barnard. The estimated cost of the hospital is £500.

THE ROYAL INSTITUTION.—Professor A. M. Worthington, M.A., F.R.S., entertained his audience at the Royal Institution on Friday evening last with a description of the phenomena observed when a drop of liquid impinges upon a solid or liquid body. These, he explained, most exactly illustrate most of the mechanical principles involved in fluid motion. The forms assumed by drops of water, milk, and mercury were thrown upon a screen. In this manner the ebbing and flowing of water, the rippling of small waves, and the rise and fall of gigantic billows were reproduced in the most minute manner and in the smallest space of time.—The Friday evening discourse at this institution on June 1st will be delivered by Professor Oliver Lodge, F.R.S. The subject will be "The Work of Hertz."

PRESENTATION TO A MEDICAL MAN IN DURHAM.—At a meeting held in the Lynesack School on Thursday, the 17th inst., Mr. Reginald Koettlitz, M.R.C.S. Eng. &c., was presented with a valuable instrument case, together with a purse of sovereigns, "as a mark of esteem and appreciation of his services" during the nine years of his medical practice in Butterknowle and neighbourhood. The meeting, which was most cordial in tone, expressed by resolution regret at Mr. Koettlitz's departure and wished him every success in his future career.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The following gentlemen have been elected examiners for the ensuing year:—Anatomy and Surgery: John Barton, Thos. Myles, William Stoker, Sir Wm. Stokes. Physiology and Histology: J. Alfred Scott. Biology: J. Alfred Scott. Pathology: R. Glasgow Patteson. Midwifery and Gynæcology: Samuel R. Mason. Ophthalmology: Arthur Henry Benson, Patrick William Maxwell. Dentistry: John Barton, John J. Burgess, F. T. Porter Newell, Samuel George Reeves, Thos. Studley, Charles Wall. Diploma in State Medicine: J. Dallas Pratt, D. Edgar Flinn, R. Glasgow Patteson, W. H. Malcolmson. Midwifery Diploma: H. B Goulding, Samuel R. Mason, Jeremiah O'Donovan. General Education: Robert J. Montgomery, Robert Morton.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The annual dinner of this society took place at the Whitehall Rooms of the Hôtel Métropole on Tuesday, the 22nd inst., under the able and genial chairmanship of Mr. M. Carteighe, the President. About 250 members and guests were present, and among the latter were the presidents of most of our medical and learned societies. Mr. Hulke and Dr. Phillipson replied for the medical profession; Professor Mendeléef of the University of St. Petersburg and Professor Michael Foster spoke for Science; and Sir Walter Foster, M.P., responded on behalf of the "Houses of Parliament." Sir Dyce Duckworth proposed the "Pharmaceutical Society of Great Britain" and coupled with the toast the health of its President. A very pleasant evening was passed by all present.

QUEKETT MICROSCOPICAL SOCIETY.—At a meeting of this society on May 18th, Mr. A. D. Michael (Pres. R.M.S.), Vice-President, in the chair, Mr. C. L. Curties exhibited a new instantaneous photo-micrographic apparatus and explained the method of using it. Some excellent pictures of pond life, fresh human blood, &c., taken by this apparatus were handed round for inspection, and one group of lophopus fully extended, surrounded by vorticellæ, was particularly admirable and life-like. The Chairman thought this apparatus would be especially valuable for obtaining representations of quickly moving organisms, which were almost impossible to draw in a natural way because of their rapid evolutions, and they might get composite pictures which would throw some light on this difficult subject of locomotion in minute animals, such as had been done by Muybridge and others with the horse, for instance. Mr. G. Western read some interesting notes on foreign rotifers.

AT the International Medical Congress recently held in Rome the King of Italy, we are informed, did Messrs. Burroughs, Wellcome and Co. the honour to accept from the hands of their agent a portable field medicine chest.

ST. GEORGE'S HOSPITAL GRAPHIC SOCIETY.—The annual general meeting of this society will be held on Tuesday, May 29th, at 2.30 P.M. After the meeting the annual Exhibition will, by permission of the governors, be held in the Board-room of the hospital, and will remain on view until the end of the week.

THE Lord Chancellor of Ireland has made the following appointments to the Commission of the Peace:—Dr. J. M. Harrington, Tralee, for county Kerry; Dr. Connor Maguire, Claremorris, for county Mayo; Mr. Philip Francis Colgan, Greenville, and Mr. William Delany, Bagnalstown, for county Carlow; and Mr. James J. Hopkins, Leenane, for county Galway.

ROYAL UNIVERSITY OF IRELAND.—The following exhibitions and honours have been awarded:—*Second Examination in Medicine:*—Exhibitions—First Class: £25, Thomas Finucane; Second Class: £15, Robert J. Murray. Honours—First Class: Thomas Finucane and Robert J. Murray. — *Medical Degrees Examination:*—Exhibition—Second Class: £25, William Thompson. Honours—Second Class: William Thompson — *Doctor of Medicine:*—John McNamara, awarded Gold Medal.

BRITISH MEDICAL TEMPERANCE ASSOCIATION.—The eighteenth annual meeting of this association was held on Tuesday, the 22nd inst., at the London Temperance Hospital. The President, Sir B. W. Richardson, was in the chair and there was a good attendance. The report, read by the honorary secretary, Dr. J. J. Ridge, showed that there are 416 members, 75 student associates, and 2 associates, and the treasurer, Dr. Morton, reported a balance in hand of £8 15s. Papers were then read on the Attitude of the Medical Profession to the Use of Alcoholic Liquors: "As It Has Been" by Dr. Norman Kerr, and "As It Is" by Dr. Ridge; Professor Horsley was unfortunately unable to read his paper on "As It Should Be." Dr. Kerr defended the profession in the past by instancing large numbers of medical men who had declared for total abstinence. Dr. Ridge argued that the use of drink where medical men did not consult the fancies and whims of their patients, as in workhouses, had diminished 60 per cent. in the last twenty years, and that in most hospitals there had been a similar considerable reduction. Medical opinion was in a transition state, but was increasing in favour of total abstinence, and more were practising it every year; in course of time he believed that the attitude of the profession would be altogether opposed to the ordinary use of alcoholic liquors. Drs. Pringle, Moir, Atkinson, Paramore, and the President took part in the subsequent discussion.

Parliamentary Intelligence.

Dispensary Committees in Ireland.

A SHORT Bill has been introduced into the House of Commons repealing the existing law on the subject, and conferring on the Irish Local Government Board the power of fixing the rating qualification on members of dispensing committees in Ireland. Under the existing law the property qualification of members who are not elected or ex-officio guardians is "thirty pounds at the least," and in the view of the promoters of the Bill some of the most eligible ratepayers in dispensary districts are in consequence disqualified from serving upon their local committees.

Experiments on Living Animals.

Mr. John Ellis has addressed to the Home Secretary a long series of questions on this subject. Among other things he desires to know whether the figures contained in the Parliamentary return are obtained by the Department from the licensees who perform the experiments, and in that case whether any steps are taken to verify them; who is the judge as to whether the severe pain has been induced which necessitates the killing of the animal; whether each of the fifty-six licensed places has been visited during the year; whether any of the 121 visits of inspection were surprise visits, and, if so, how many; and whether the Home Secretary has personally satisfied himself that the licences and certificates are all issued only to such places and persons and with such objects as were contemplated by the Cruelty to Animals Act, 1876. The questions will probably be answered in the course of next week.

HOUSE OF COMMONS.

MONDAY, MAY 21ST.

Insanitary Public Buildings.

In committee of supply on the Civil Service Estimates Mr. Hanbur

called attention to the alleged insanitary state of the old Coldbath Fields Prison, now used by the Post Office.—Mr. A. Morley stated that a small commission had been appointed to inquire into the matter.—Mr. Barns urged that all post-offices should be open to inspection by the local sanitary authorities.—Mr. A. Morley promised to consult the First Commissioner of Works on the subject.

TUESDAY, MAY 22ND.

The Gresham Commission.

The Chancellor of the Exchequer informed Sir A. Rollit that the evidence had been printed and was now before the Commissioners for revision.

WEDNESDAY, MAY 23RD.

Prevention of Cruelty to Children Bill.

An important clause, making it an offence for a child to sell articles in the streets between the hours of 9 P.M. and 6 A.M., was added to this Bill.

The Adulteration of Food.

In the course of next week Mr. Kearley will ask the President of the Local Government Board to consider the propriety of nominating a Select Committee of the House of Commons to inquire into the general question of food adulteration.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week for publication in the next number.

ALTHAUS, J., M.D. Berlin, M.R.C.P. Lond., has been appointed Consulting Physician to the Hospital for Epilepsy and Paralysis, Regent's Park.

BARNISH, W. C., M.R.C.S., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

BERRY, WM., F.R.C.S. Irel., L.R.C.P., L.R.C.S. Edin., M.R.C.S., D.P.H. Glasg., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

CAGNEY, JAMES, M.D., M.Ch. Irel., M.R.C.P. Lond., has been appointed Physician, with charge of In-patients, to the Hospital for Epilepsy and Paralysis, Regent's Park.

CARDINALL, C. D., M.R.C.S., L.R.C.P., L.S.A., has been appointed Senior House Surgeon to the Western General Dispensary.

COULSON, JAMES E., M.R.C.S., L.R.C.P., has been appointed Junior Assistant Medical Officer at St. George's Infirmary, Fulham-road.

COWAN, R. H., M.R.C.S., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

GRAHAM, C. R., L.R.C.P. Edin., M.R.C.S., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

GUILDING, L. M., M.B., B.Ch. Oxon, M.R.C.S., has been appointed Medical Officer for the Workhouse, Reading.

JONES, HUGH E., L.R.C.P. Lond., M.R.C.S., has been reappointed Honorary Assistant Ophthalmic Surgeon to the Royal Albert Edward Infirmary, Wigan.

KENDALL, NICHOLAS F., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Assistant Resident Medical Officer to Woolwich Infirmary.

MCAVOY, HUGH, L.R.C.S.I., L.K.Q.C.P.I., L.M. Rotunda, has been appointed Junior House Surgeon to the Jervis-street Hospital, Dublin.

MCCOMISKEY, A. W. S., M.B., B.Ch., L.R.C.P., L.M., L.R.C.S. Irel., has been appointed Medical Officer for the Kilbough Dispensary District.

MCDOUGALL, A. H., L.R.C.P. Lond., M.R.C.S., has been appointed Assistant Medical Officer for the Crumpsall Workhouse and of the New Bridge-street Receiving and Casual Wards, the township of Manchester.

MOLLOY, W. J., M.B., B.Ch. R.U.I., has been appointed Senior House Surgeon to the Jervis-street Hospital, Dublin.

MONKS, E. H., L.R.C.P., L.M., M.R.C.S., has been reappointed Honorary Consulting Physician to the Royal Albert Edward Infirmary, Wigan.

MOYNIHAN, J. J., L.R.C.P., L.C.R.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Ballinspittle Dispensary District.

MULLALLY, W. T., M.D., M.Ch. R.U.I., Dipl. San. Sci., R.C.P.I., has been appointed a Honorary Physician to the Ballarat District Hospital, Australia.

O'CONNOR, JOHN E., M.B., B.S. Irel., has been appointed Medical Officer for the Glenfield Sanitary District of the Blaby Union.

PARE, J. W., M.D. Edin., and C.M., L.D.S., has been appointed Demonstrator to the National Dental Hospital, Great Portland-street, W.

POWNE, L., M.R.C.S., has been reappointed Medical Officer for the Newton St. Cyres Sanitary District of the Crediton Union.

ROBERTS, EDWARD, M.R.C.S., has been appointed Surgeon to the Manchester Royal Eye Hospital.

ROOCROFT, W. MITCHELL, L.R.C.P., L.M. Edin., M.R.C.S., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

ROOCROFT, WILLIAM, M.R.C.S., has been appointed Honorary Consulting Surgeon to the Royal Albert Edward Infirmary, Wigan.

SHAW, R. F., L.R.C.P., L.R.C.S., L.M. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Kirkburton Sanitary District of the Huddersfield Union, vice Loundes resigned.

SHEPHERD, C. D., M.R.C.S., has been appointed Honorary Consulting Surgeon to the Royal Albert Edward Infirmary, Wigan.

STEINTHAL, W. M., L.R.C.P. Lond., M.R.C.S., has been reappointed Resident Assistant Medical Officer for the Crumpsall Workhouse, the township of Manchester.

TATTERSALL, C. H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Oldham Urban Sanitary District of the Oldham Union.

WEEKES, HENRY H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Gillingham Sanitary District of the Medway Union.

WHITE, R. P., M.D., C.M. Edin., M.R.C.S., has been reappointed Honorary Surgeon to the Royal Albert Edward Infirmary, Wigan.

WILLIAMS, RICHARD, L.R.C.P. Edin., L.F.P.S. Glasg., has been re-appointed Honorary Ophthalmic Surgeon to the Royal Albert Edward Infirmary, Wigan.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BRIDGWATER INFIRMARY.—House Surgeon. Salary £70 per annum, with board and residence.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria-park, E.—House Physician for six months. Board and residence and allowance for washing provided.

FLINTSHIRE DISPENSARY.—Resident House Surgeon. Salary £120 a year, with furnished house, rent and taxes free; also coal, light, water, and cleaning, or in lieu thereof £20 per annum.—Applications to the Secretary, Board-room, Baglilt-street, Holywell.

GLAMORGANSHIRE AND MONMOUTHSHIRE INFIRMARY, Cardiff.—Assistant Resident Medical Officer for six months. Board, washing, and apartments provided.

GLASGOW EYE INFIRMARY.—Resident Assistant House Surgeon. Salary £50, with apartments and board.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—Casualty Officer, who will be required to act as Registrar and Assistant Anæsthetist. Honorarium at the rate of 50 guineas per annum.

HOSPITAL FOR EPILEPSY AND PARALYSIS AND OTHER DISEASES OF THE NERVOUS SYSTEM, 32, Portland-terrace, Regent's-park, N.W.—Physician to Out-patients.

JAFFARY SUBURBAN BRANCH OF THE GENERAL HOSPITAL, Gravelly-hill, near Birmingham.—Resident Medical and Surgical Officer. Salary £150 per annum, with board, residence, and washing.

MILLER HOSPITAL AND ROYAL KENT DISPENSARY, Greenwich.—Honorary Surgeon.

NORTHUMBERLAND COUNTY ASYLUM, Morpeth.—Clinical Assistant. Board and residence provided.

PARISH OF BIRMINGHAM.—Resident Assistant Medical Officer for the Workhouse Infirmary. Salary £100 per annum, with furnished apartments, rations (which do not include alcoholic liquors), coals, gas, washing, and attendance. Applications to the Clerk to the Guardians, Parish Offices, Edmund-street.

PARISH OF ST. GEORGE-IN-THE-EAST, London.—Medical Officer for the Infirmary and Workhouse. Salary £350 per annum, with unfurnished house, gas, coal, and water. No fees for Midwifery or for certifying lunatics will be allowed. Applications to the Clerk, Clerk's Offices, Raine street, Old Gravel lane, E.

PUBLIC DISPENSARY, 59, Stanhope-street, Clare-market, London.—Resident Medical Officer. Salary £105 per annum, with furnished apartments, coals, and gas. Applications to the Secretary, 14, Portugal-street, Lincoln's-inn.

ROYAL BERKS HOSPITAL, Reading.—Assistant House Surgeon for six months. Board and lodging provided.

ROYAL ORTHOPÆDIC HOSPITAL, 297, Oxford street, London.—Resident House Surgeon and Apothecary, unmarried. Salary £100 per annum, with partial board.

THE YORKSHIRE COLLEGE, Leeds (DEPARTMENT OF MEDICINE).—Honorary Demonstrator of Surgical Pathology.

WESTMINSTER HOSPITAL, Broad Sanctuary, S.W.—Dental Surgeon.

WORCESTER GENERAL INFIRMARY.—Assistant House Surgeon and Dispenser for two years, unmarried. Salary £70 per annum, with board, residence, and washing.

Births, Marriages and Deaths.

BIRTHS.

DALISON.—On May 16th, at Ilsington Lawn, Puddletown, Dorset, the wife of Bernard E. Dalison, Esq., M.B. Edin., of a daughter.

HARDING.—On May 20th, at Sanogate, the wife of Surgeon-Major A. Harding, A.M.S., of a daughter.

JACOBSEN.—On May 15th, at Ashwell, Baldock, the wife of G. Oscar Jacobsen, M.R.C.S., L.R.C.P., of a son.

KERSHAW.—On May 13th, at Oxford-place, Guernsey, the wife of Surgeon E. E. Kershaw, R.N., H.M.S. *Howe*, of a son.

MORGAN.—On May 13th, at Pill, Bristol, the wife of T. Whitworth S. Morgan, M.R.C.S., of a son.

DEATHS.

HAMPSHIRE.—On May 16th, at Jersey, Frederick Knowlton Hampshire, M.B., M.R.C.S., late Colonial Surgeon, Straits Settlements, aged 50.

REECE.—On May 20th, suddenly, Richard Reece, M.R.C.S., of Walton-on-Thames, aged 85.

WARD.—On May 17th, at his residence, Blyth, Northumberland, Gilbert Ward, F.R.C.S. Eng., aged 89.

WARNEFORD-THOMSON.—On May 15th, at Merriott, Somerset, Herbert Warneford-Thomson, L.R.C.P., formerly of Queen's-road, Brownswood-park, N., aged 43.

WEIR.—On May 17th, at St. Mungho's, Great Malvern, Archibald Weir, M.D., F.R.C.S. Edin., aged sixty-five years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Stewart's Instruments.)

THE LANCET Office, May 24th, 1894.

	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Dry Bulb.	Wet Bulb.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp	Rainfall.	Remarks at 8.30 A.M.
May 18	30·16	N.E.	56	52	114	69	46	..	Cloudy
,, 19	30·20	E.	47	44	91	53	44	..	Overcast
,, 20	30·05	N.E.	46	40	99	51	40	..	Cloudy
,, 21	29·96	N.E.	47	42	93	52	36	..	Cloudy
,, 22	30·02	N.E.	48	42	98	53	37	..	Cloudy
,, 23	30·12	N.E.	47	46	66	57	43	0·04	Raining
,, 24	30·26	N.E.	57	52	107	63	45	0·10	Bright

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (1 P.M.), St. Mark's (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynecological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.).

TUESDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1.30 P.M.). St. Mark's (2.30 P.M.), Cancer (2 P.M.).

WEDNESDAY.—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), Great Northern Central (2.30 P.M.), King's College (2 P.M.). National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Great Ormond-street (9.30 A.M.).

THURSDAY.—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (2 P.M.), Chelsea (2 P.M.), Soho-sq. (2 P.M.), North West London (2 P.M.)

FRIDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.). Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.).

SATURDAY.—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), Cancer (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

WEDNESDAY.—DERMATOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.—4 P.M. Introductory Address by Dr. Pye-Smith. 4.30 P.M. Exhibition of Cases.

THURSDAY.—DERMATOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.—5 P.M. Dr. Byrom Bramwell: Thyroid Feeding in Diseases of the Skin. 9 P.M. Annual Meeting and Conversazione.

FRIDAY.—WEST LONDON MEDICO-CHIRURGICAL SOCIETY (West London Hospital).—8 P.M. Clinical Meeting. Dr. Scanes Spicer: Case illustrating the Radical Cure of Fetid suppuration of the Nose by Free Opening, Curettement, and Drainage of Maxillary Antrum.—Mr. McAdam Eccles: (1) Case of probable Deposit of Urate of Soda in the Scrotum; (2) Case of Multiple Tumours of the Abdominal Wall. Mr. T. R. Atkinson: Case of Multiple Lipomata.—Mr. L. A. Bidwell: (1. Congenital Tumour over Sacrum; (2) Syphilitic Disease of Humerus which caused Spontaneous Fracture.—Dr. Morgan Dockrell: (1) Rodent Ulcer of Twenty Years' Duration treated with Resorcin; (2) Case of Mycosis Fungoides.—Dr. Abraham: Cases of Skin Disease.

LECTURES AND ADDRESSES.

MONDAY.—ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 P.M. Mr. James Henry Targett: Hydatids in Bone. (First Erasmus Wilson Lecture)

LONDON POST-GRADUATE COURSE.—London Throat Hospital, Great Portland-street, W., 8 P.M., Mr. George Stoker: Chronic Glandular Diseases of the Naso-pharynx.

ST. JOHN'S HOSPITAL FOR SKIN DISEASES (Leicester-sq., W.C.).—6 P.M. Dr. Morgan Dockrell: Eczema.

TUESDAY.—LONDON POST-GRADUATE COURSE.—Bethlem Hospital, 2 P.M., Dr. Percy Smith: Puerperal and Lactational Insanity.

WEDNESDAY.—LONDON POST-GRADUATE COURSE.—Hospital for Skin Diseases, Blackfriars, 1 P.M., Dr. Payne: Pemphigus and its Allies.

METROPOLITAN HOSPITAL (Kingsland-road, N.E.).—5 P.M. Dr. Gow: The Surgical Aspect of Tubal Disease. (Post-graduate Lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 P.M. Mr. James Henry Targett: Hydatids in Bone. (Second Erasmus Wilson Lecture.)

THURSDAY.—LONDON POST-GRADUATE COURSE.—Hospital for Sick Children, Gt. Ormond-st., 3.30 P.M., Dr. Barlow: Clinical Lecture.—National Hospital for Paralysed, Bloomsbury, 2 P.M., Dr. Beevor: Muscular Atrophy.—Central London Sick Asylum, Cleveland-st., W., 5.30 P.M., Dr. Pye-Smith: Cases in the Wards.

FRIDAY.—LONDON HOSPITAL MEDICAL COLLEGE.—4 P.M. Mr. Jonathan Hutchinson: On Family Diseases.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 P.M. Mr. James Henry Targett: Tumours of Kidney in Children. (Third Erasmus Wilson Lecture.)

SATURDAY.—LONDON POST-GRADUATE COURSE.—Bethlem Hospital, 11 A.M., Dr. Hyslop: Climacteric and Senile Insanity.

Notes, Short Comments & Answers to Correspondents.

EDITORIAL NOTICE.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side only of the paper.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Publisher."*

We cannot undertake to return MSS. not used.

PUBLISHER'S NOTICE.

IN order to facilitate the work of reference to the volumes of THE LANCET, we have arranged to publish duplicate copies of the Index to each half-yearly volume in a form in which they may be subsequently filed or bound together. Those of our subscribers who may wish to be supplied with loose copies can obtain the same (without extra charge) on making application to the Publisher of THE LANCET.

A MEDICAL MAGISTRATE.

A VERY amusing occurrence is reported from Faversham. An inmate of the Union Workhouse told a sad story of an intermittent heart when defending himself from a charge of refusing to perform his task of work. The magistrate was Dr. J. Irvine Boswell, who heard the story, and then left the bench to make practical investigation with eye, finger and stethoscope into its truth. As a result the malingerer received seven days' hard labour.

Nestor.—We do not see the force of the objection made by our correspondent. The chairman of a board can only act as such on the authority of his board. The testimonial is a good one.

R. D.—Our advertisement columns and those of the Medical Director contain the information required.

H. C.—Bordighera, Italy. It is against our rule to recommend individual practitioners.

J. M. should apply directly to the Obstetrical Society, 20, Hanover-square, W.

CHLOROFORM VAPOUR AS AN IRRITANT TO THE LARYNX.

To the Editors of THE LANCET.

SIRS,—The subject of chloroform administration is one that so constantly occupies the attention of the medical profession that one might well apologise in requesting space for a somewhat lengthy communication on it, and the more so when the writer can claim no specially large experience. However, in reading the following account it will I trust, appear that it possesses at least two features that will serve to justify your kindness in its insertion, and to compensate your readers for the time they may occupy in its perusal. These are, first, that with certain circumstances attending its administration, chloroform may act as a severe irritant to the larynx, producing spasmodic cough and dyspnœa; secondly, that these toxic effects are not exerted upon the patient, but upon the operator and his assistants.

On Monday, April 30th last, I found it necessary to operate on a girl aged thirteen, an in-patient of the Liverpool Eye and Ear Infirmary, for what I supposed to be a distension of the frontal sinus, and, inasmuch as we judged that the operation was likely to occupy some time, we selected the evening for its performance, when the out-patient and other work of the infirmary would be finished. Accordingly, at 7.30 P.M. the patient was brought into the operating theatre, and the house surgeon administered chloroform, which the patient took well. I commenced the operation, having the assistance of the matron, Miss Bramwell, and two nurses. Daylight shortly began to fail, and it was necessary to light a gas bracket, the operating table being moved to

about three feet from the bracket. As was anticipated, some difficulty was experienced in introducing a drainage-tube, and the operation had occupied half an hour or so when I began to experience a sensation of irritation at the back of the throat, also a slight feeling of suffocation, and very shortly a sharp, spasmodic cough commenced, which recurred every few moments, and was quite uncontrollable. The matron almost simultaneously exhibited the same train of symptoms, but in her case the cough was more violent, and the conjunctivæ were suffused. Dr. Jameson, the house surgeon, and one of the nurses were also similarly affected, though in a minor degree. The patient herself did not cough at all, and took the anæsthetic in an entirely satisfactory manner. We were able to conclude the operation in about five minutes after the onset of our symptoms, and on going into the comparatively pure air of the corridor the cough shortly subsided, though for about two hours a little hoarseness was left, and some excessive mucous secretion was present. About two ounces of chloroform were used; it was administered on an open towel; it had not been exposed to light previously, and it was manufactured by Messrs. Duncan and Flockhart. The specific gravity as stated on the bottle was 1497, while the temperature of the theatre was 58° F.

Were this the only occasion in which these effects were noticed I should not have ventured to draw attention to them, but I have had almost identical experiences on at least three previous occasions when the chloroform was exhibited in proximity to a naked gas flame. Once my colleague, Mr. Hugh E. Jones, who was present, had the same trying symptoms, and I think Miss Bramwell was troubled each time. The foregoing is a simple statement of what occurred. The necessary factors for producing the effects seem to be a somewhat prolonged time during which the chloroform is used, twenty minutes being perhaps the briefest period, and the near presence of a coal-gas flame. I am unable to offer any explanation of the facts. On Thursday evening, the 3rd inst., we indeed tried the experiment of slowly pouring on a towel, no patient being present, about two ounces of chloroform, part of the contents of the same bottle that had been employed the previous Monday, and exposed some damp lint stained with a solution of cochineal to the vapour, hoping that if free chlorine were present some bleaching effects might be visible, although at the end of thirty minutes the cough and spasm were produced and obliged us to leave the room owing to their severity. There was no appreciable change in the colour of the dye. I may add that personally I am not particularly sensitive to throat irritation, nor are any of those whom I have mentioned as having been affected. The eminence of the manufacturers forbids us suspecting any impurity in the anæsthetic itself. Hoping that some elucidation of the above facts may be suggested by some of your readers.—I remain, Sirs, yours truly,

CHARLES GEO. LEE, M.R.C.S., L.R.C.P. Lond.
Hon. Surgeon, Liverpool Eye and Ear Infirmary, &c.

Rodney-street, Liverpool, May 7th, 1894.

*** The symptoms to which Mr. Lee refers are due to the decomposition of chloroform vapour which takes place in the presence of lighted illuminating gas, a body called phosgene gas being formed. Langenbeck pointed out this some years back, and Dr. Patterson, in the forty-second volume of *The Practitioner*, represents the reaction as $2CHCl_3+2O=2COCl_2+2HCl$. As a rule the patient is the chief sufferer, and in some instances severe pulmonary symptoms follow the inhalation under the conditions described by our correspondent.—ED. L.

Mr. H. A. Lakhani.—We purposely abstained in our articles upon American medical education from giving the information our correspondent asks us for.

Mr. G. W. Edmondson.—We think that, under the circumstances, our correspondent is entitled to a fee.

E. Kent.—We will take notice of the point our correspondent mentions.

Walter Allen Manning.—We do not undertake such work.

ANSELL *v.* TAIT.

To the Editors of THE LANCET.

SIRS,—Will you kindly acknowledge the following additional subscriptions to the above fund?

Mr. Howard Marsh	£5	5	0	Mr. D. O. Fountaine	£1	1	0
Mr. Anthony A. Bowlby	2	2	0	Dr. D. McB. Greig	1	1	0
Dr. T. Lauder Brunton	2	2	0	Mr. C. P. Hooker	1	1	0
Dr. F. H. Champneys	2	2	0	Mr. C. A. James	1	1	0
Mr. W. Bruce Clarke	2	2	0	Dr. Alexander Morison	1	1	0
Dr. Walter Griffiths	2	2	0	Dr. John Mulvany	1	1	0
Mr. John Langton	2	2	0	Mr. W. H. Paine	1	1	0
Mr. W. J. Walsham	2	2	0	Mr. W. Patmore Sheehy	1	1	0
Mr. Henry T. Butlin	2	0	0	Mr. D'Arcy Power	1	1	0
Dr. Garrod Thomas	2	0	0	Mr. Henry Power	1	1	0
Dr. John Abercrombie	1	1	0	Dr. Leonard Remfry	1	1	0
Dr. E. D. Berton	1	1	0	Dr. A. E. Sansom	1	1	0
Mr. E. Calthrop	1	1	0	Mr. W. R. H. Stewart	1	1	0
Mr. Alban Doran	1	1	0	Mr. H. G. Sworn	1	1	0
Dr. D. Fairweather	1	1	0	Dr. E. Clapham	0	10	6

I am, Sirs, yours faithfully,

G. T. KEELE, Treasurer.

81, St. Paul's-road, Highbury, N., May 23rd, 1894.

"HERBALISTS IN CONFERENCE."

WE are informed by the Secretary of the Royal Microscopical Society that the name of Charles Walden, which appeared in THE LANCET of May 12th, in an annotation under the above heading, with the affix "F.R.M.S.," is not upon the official lists of Fellows of that Society.

H. G. D. would perhaps do well to consult one of our contemporaries devoted to the sport in question.

M.R.C.S.—Yes; they have been found useful, but not invariably so.

Dick.—We cannot answer our correspondent's queries.

Nemo has forgotten to enclose his address.

"THE TREATMENT OF IMPERMEABLE STRICTURES OF THE URETHRA."

To the Editors of THE LANCET.

SIRS,—The method of permeating tight strictures suggested by Mr. Charles H. Wade in THE LANCET of May 12th is one that was proposed by Dr. J. P. Malony of Waterbeach, Cambridge, in 1872, differing from it only in the substitution of a silver catheter for an elastic one. Dr. Malony did not claim originality for his proposal, referring to it as a slight modification of "what is generally known as 'Hutton's railway catheter,'" the modification consisting in the use of a No. 10 instead of a No. 2 instrument. During a practice of upwards of twenty-one years in the East I had occasion to use this method, modifying it in the same way as Mr. Wade does, in seventy-one cases of tight urethral stricture, and failed to reach the bladder within a few minutes in two cases only. In those two cases a stricture was in the penile portion of the urethra, and the instrument after passing through it was stopped by what I believe was another stricture in the membranous portion. In each of the two cases the instrument (a filiform French bougie) being left in for twenty-four hours and then withdrawn, a new instrument of the same size was passed into the bladder with little trouble. The method may therefore be claimed as one of great value.

Another most successful means of permeating very tight urethral strictures is "catheterism on physiological principles," as advocated and described in detail by Mr. Gay in THE LANCET for Nov. 16th, 1878. He there mentions that he published this method in June, 1861; but I do not think that either of the above-mentioned means of overcoming a very serious state of affairs has ever received the attention which it deserves from the medical profession.

I am, Sirs, your obedient servant,

Upper Woburn-place, W.C., May 12th, 1894. P. GOWAN, M.D.Edin.

Mr. C. Fleming should apply to the Editor of "The Young Man," 2, Amen-corner, Paternoster-row, E.C.

Messrs. Roberts and Co.—We regret that we are unable to accede to our correspondents' request.

Mr. E. Seaton Cockell's communication shall receive attention.

THE GRIFFITHS FUND.

To the Editors of THE LANCET.

SIRS,—Will you kindly acknowledge the following subscriptions to this fund, which we have received since the issue of THE LANCET of the 19th inst?

Already acknowledged	£94	12	6	C. J. Cullingworth	£1	1	0
T. Lauder Brunton	2	2	0	G. Grice-Jones	1	1	0
Lawson Tait	2	2	0	A. Sheen	1	1	0
A. Garrod Thomas	2	0	0	W. V. Snow	1	1	0
G. Herbert Hopkins	1	1	0	Henry T. Butlin	1	0	0

We are, Sirs, yours faithfully,

W. F. BROOK,
E. LE CRONIER LANCASTER, } Hon. Secs.

Winchester House, Swansea, South Wales, May 22nd, 1894.

ERRATUM.—We alluded to Dr. G. V. Benson in our issue of last week as "B.A. Durham." It should have been *B.A. Dublin.*

COMMUNICATIONS not noticed in our present issue shall receive attention in our next.

During the week marked copies of the following newspapers have been received:—*Birkenhead News, Isle of Man Times, Northern Whig, Bradford Observer, Journal of Gas Lighting, Water-supply, &c., Abingdon Herald, Sunderland Herald, Dundee Advertiser, Glasgow Evening News, Coventry Herald, Nottingham Daily Guardian, Kendal City News, Lowestoft Standard, Court Journal, Ripley Advertiser, Newry Standard, Scarborough Post, Malton Messenger, Skibbereen Eagle, Newark Herald, Times of India, Pioneer Mail, Southern Times, Leamington Spa Courier, Mandalay Herald, Nuneaton Advertiser, Family Doctor, Vegetarian, Night and Day (May), Weekly Budget, City Press, Morning, Health, Yorkshire Post, Liverpool Daily Post, Le Courrier de la Presse (Paris), Sanitary Record, Bristol Mercury, Local Government Chronicle, West Middlesex Standard, Reading Mercury, Weekly Free Press and Aberdeen Herald, Leeds Mercury, Local Government Journal, Surrey Advertiser, Science Siftings, Surrey Mirror, Le Temps (Paris), Birmingham Post, Star, Builder, Public Opinion, Architect, &c., &c.*

Communications, Letters &c. have been received from—

A.—Dr. F. P. Atkinson, Surbiton; Mr. T. M. Angior, Wigan; Mr. D. Anderson, London; *Argus de la Presse*, Manager of, Paris; Admiralty, Medical Department, Director General of; A. Z., London.

B.—Dr. F. E. Batten, London; Dr. Brushfield, Wimbledon; Dr. E. Cresswell Baber, Brighton; Dr. F. W. Burton-Fanning, Norwich; Mr. E. V. Benson, London; Mr. Alfred Berrill, London; Mr. W. F. Brock, Swansea; Miss Beadon, London; Messrs. Bicker and Son, London; Messrs. Boulton & Paul, Norwich; Bridgwater Infirmary, Secretary of; *Birmingham Daily Post*, Proprietors of; B. F. K., London.

C.—Dr. A. W. H. Clemow, London; Dr. W. A. Clark, London; Mr. H. Crossley, Bordighera; Mr E. S. Cockell, West Hartlepool; Mr. J. D. Crawford, St. Clement's, Jersey; Messrs. Crossley, Moir and Co., London; Messrs. J. and A. Churchill, London; Messrs. Carnrick and Co., London; Children's Nursing Home, Barnet, Hon. Treasurer of.

D.—Dr. S. Davies, London; Mr. H. G. Dixon, London; Mr. C. P. Dunhill, Drum; Du Val Restaurant, London, Manager of; Delta, London.

E.—Mr. E. H. Ellison, Castleton; East London Hospital for Children, Secretary of.

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